

Sandown Wireless E.F. Johnson 2004 Catalog

Ordering Information

Tel: 603-548-0125

Fax: 603-887-2117

e-mail: sales@criticalradio.com

Address:

P.O. Box 564

East Hampstead, NH 03826

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Quality

Service

Value

Sandown Wireless USA 2004 Catalog

Choice

Mobiles



EFJohnson[®]

5300 Series

VHF
UHF
800 MHz

ANALOG/DIGITAL MOBILE RADIO

- APCO Project 25 Compatible – Trunked and Conventional
- SMARTNET® and SmartZone®
- Analog FM
- Encryption

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.

The 5300 Series Analog/Digital Mobile Radio provides Project 25 compatibility along with SMARTNET®/SmartZone® capability to meet the needs of federal, state, and local government users, as well as business, industrial and public safety applications. Switching between SMARTNET/SmartZone Project 25 and conventional analog equipment is simple – just turn the channel knob.

Multiple Protocol Compatibility:

– **Project 25 CAI (Common Air Interface)** enables users to communicate with other Project 25 compatible radios. The 5300 supports Project 25 trunked and conventional communications, as well as Motorola® ASTRO® trunking.

– **SMARTNET® II and SmartZone® Trunking Protocols** are supported.

Backward Compatibility provides the flexibility to communicate in both narrow and wideband analog channels, in addition to narrowband digital.



Forward Compatibility is provided via a scalable design that allows new features and applications to be integrated into the existing radio platform.

Encrypted Communications for wideband legacy systems and narrowband operation. DES and DES-XL™ enable secure voice communications in wideband channels; Project 25 DES-OFB and AES encryption provide secure communication in narrowband channels.

Multiple System Select is an advanced feature that enables the user to simply change the communications protocol from analog to digital by pressing a button.

Over-The-Air-Rekeying (OTAR) option enables encryption keys and other related key management messages to be securely sent through the air from a key management facility (KMF).

Handheld Controller Option provides DTMF operation as well as all the functions of a control head.

Field Programmable Capability

provides National Telecommunications and Information Administration (NTIA) agencies the ability to reprogram conventional frequencies, CTCSS, DCS, and talkgroups into the radio's memory.

10-Character Alphanumeric Display provides a backlit visual display of the radio's channel or talkgroup on the front of the radio. Tilt viewing angle allows for easy viewing anywhere in the vehicle and in any light condition.

100-Watt Option allows extra power for VHF communication systems.

PC Programmability: Program an unlimited number of radios with the click of a mouse, using EFJohnson's PC Configure™ application – support both mobile and portable platforms in a single configuration software package.

Rotary Knobs mounted on the front of the mobile provide easy channel and volume adjustment.

Optional Remote Mounting gives more flexibility for installation in tight spaces. Available as a factory ordered option.



Project 25
Trunking

SMARTNET®
SmartZone®
Digital

Project 25
Conventional

SMARTNET®
SmartZone®

Conventional

5300 SERIES

ANALOG/DIGITAL MOBILE RADIO

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL NUMBER	531X	532X	533X/6X	538X
GENERAL	VHF	VHF	UHF	800 MHz
Frequency Range	136–174 MHz	146–174 MHz	380–470 MHz 403–470 MHz	806–870 MHz
Zones/Channels	16/16			
Mounting	Dash-mount, Remote-mount			
Input Voltage	13.6 VDC (negative ground)			
Dimensions (HxWxD)	2.1" x 7.15" x 8.3" (5.3 cm x 18.2 cm x 21.1 cm)	2.1" x 7.15" x 13.75" (5.3 cm x 18.2 cm x 34.9 cm)	2.1" x 7.15" x 8.3" (5.3 cm x 18.2 cm x 21.1 cm)	
Weight	5 lbs. 4 oz. (2.38 kg)	8 lbs. 6 oz. (3.78 kg)	5 lbs. 4 oz. (2.38 kg)	
Case	Metal—black			
Temperature Range	–30°C to +60°C			
Current Drain @ 13.8V: Standby	0.6 A			
Received @ Rated Audio	2.7 A			
Transmit @ Rated Power	13.2 A	27.5 A	13.2 A	13.2 A
Channel Spacing	12.5, 15, 25, 30 kHz	12.5, 15, 25, 30 kHz	12.5, 25 kHz	12.5, 25 kHz
Voice Digital Mode: Voice Coding	IMBE™ 4.4 kbps			
Frame Re-sync Interval	180 msec			
Error Correction Method	RS, Golay, Hamming			
FCC Type Acceptance Number	ATH2425317	ATH2425326	ATH2425330	ATH2425384
Canada	933 195 573A	—	—	933 195 671A

RECEIVER Typical Performance Specifications (Measurements per TIA 603 Standards)

Sensitivity: Digital Mode: 5% BER**	0.35 µV			
Analog Mode: 12 dB SINAD	0.35 µV			
Selectivity	–75 dB			
Spurious & Image Rejection	–75 dB			
Intermodulation	–75 dB	–75 dB	–77 dB	–73 dB
Audio Output Power	12W			
Audio Distortion (at 1000 Hz)	<3%			
Frequency Stability (–30°C to +60°C)	±2.5 ppm	±2.5 ppm	±2.5 ppm	±1.5 ppm
Maximum Frequency Separation	Full bandsplit			

TRANSMITTER Typical Performance Specifications (Measurements per TIA 603 Standards)

RF Power Output	10W–50W variable	50W–100W variable	7W–15W variable	10W–35W variable
Spurious & Harmonic Emissions	–70	–70	–70	–60
FM Hum & Noise (Wideband)	–45 dB			
Emission Designators	8K10F1E, 11K0F3E, 16K0F3E, 20K0F1E			8K10F1E, 14K0F3E, 16K0F3E, 20K0F1E
Audio Distortion (at 1000 Hz)	<3%			
Audio Response (1000 Hz ref.)	300–3000 Hz			
Frequency Stability (–30°C to +60°C)	±2.5 ppm	±2.5 ppm	±2.5 ppm	±1.5 ppm
Modulation Limiting:				
Wideband Analog	5 kHz			5 kHz
Narrowband Analog	2.5 kHz			2.5 kHz
Maximum Frequency Separation	Full bandsplit			

** Measured in digital mode per TIA 102.CAAA and TIA 102.CAAB standards.

ENVIRONMENTAL SPECIFICATIONS				
Environment	Mil Spec 810C	Mil Spec 810D	Mil Spec 810E	Mil Spec 810F
	Method Procedure	Method Procedure	Method Procedure	Method Procedure
Low Pressure	500.1 I	500.2 I	500.3 II	500.4 II
High Temp.	501.1 I, II	501.2 I, II	501.3 I, II	501.4 I, II
Low Temp.	502.1 I	502.2 I	502.3 I	502.4 I
Temp. Shock	503.1 I	503.2 I	503.3 I	503.4 I
Solar Radiation	505.1 I	505.2 I	505.3 I	505.4 I
Rain/BlowRain	506.1 I, II	506.2 I, II	506.3 I, II	506.4 I, II
Humidity	507.1 II	507.2 II(5)	507.3 II(5)	
Fog	509.1 I	509.2 I	509.3 I	
Dust and Sand	510.1 I	510.2 I	510.3 I, II	510.4 I, II
Vibration	514.2 VIII(W)	514.3 I(10)	514.4 I(10)	514.5 I(24)
Shock	516.2 I, II, V	516.3 I, IV, VI	516.4 I, IV, VI	516.5 I, IV, VI

ENCRYPTION OPTIONS

Supported Encryption Algorithms	DES, DES-XL™, DES-OFB, AES
Encryption Algorithm Capacity	4 minimum
Encryption Keys/Radio	16 Common Key Reference (CKR) 16 Physical Identifier (PID)
Encryption Frame Re-sync Interval	P25 CAI 360 msec
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB – Cipher Feedback XL – Counter Addressing OFB – Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal pseudorandom generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

ACCESSORIES

- 12-Watt External Speaker
- Remote-Mount Conversion Kit
- Handheld Controller
- Dual Control Head Kit
- Desk Microphone
- Lockable Mounting Tray
- Power Supply



100W Option with Handheld Controller and External Speaker



5300 Series

ANALOG/DIGITAL MOTORCYCLE RADIO

531x – VHF
533x/6x – UHF
538x – 800 MHz

Project 25 Compatible – Trunked and Conventional SMARTNET® and SmartZone® Analog/Digital Radio

The 5300 Analog/Digital Mobile Radio's high-quality connection that you are accustomed to using in your patrol car is now available in a remote-mount application for use on a motorcycle.

Multiple Protocol Compatibility:

– **Project 25 CAI (Common Air Interface)** enables users to communicate with other Project 25 compatible radio equipment. The 5300 supports Project 25 trunked and conventional communications, as well as Motorola® ASTRO® trunking.

– **SMARTNET® II and SmartZone® Trunking Protocols** are supported on the Series 5300 motorcycle radio.

Backward Compatibility provides the flexibility to communicate in both narrow and wideband analog channels, in addition to narrowband digital.

Forward Compatibility is provided via a scalable design that allows new features and applications to integrate into the existing radio platform.

Encrypted Communications for wideband legacy systems and narrowband operation. DES and DES-XL™ enable secure voice communications in wideband channels; Project 25 DES-OFB and AES encryption provide secure communication in narrowband channels.

Standardized Connection allows easy interface with other industry standard motorcycle headsets and kits.



10-Character Adjustable Display lets you regulate the viewing angle electronically, enabling you to easily read it under any light condition.

Weather-Resistant Control Head (MIL 810) has six programmable function keys including a high-visibility embedded emergency button.

Noise-Cancelling Weather-Resistant Microphone and weather-resistant attenuated speaker are standard features.

Rotary On-Off/Volume Switch provides easy control of the on/off and volume functions.

VHF, UHF, and 800 MHz frequencies are offered to fit in with your current system.



Project 25
Trunking

SMARTNET®
SmartZone®
Digital

Project 25
Conventional

SMARTNET®
SmartZone®

Conventional

5300 SERIES

ANALOG/DIGITAL MOTORCYCLE RADIO

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL NUMBER	5310	5330/60	5380
GENERAL	VHF	UHF	800 MHz
Frequency Range	136–174 MHz	380–470 MHz 403–470 MHz	806–870 MHz
Zones/Channels	16/16		
Mounting	Remote-mount		
Input Voltage	13.6 VDC (negative ground)		
Dimensions (HxWxD):	Radio	2.1" x 7.15" x 8.3" (5.3 cm x 18.2 cm x 21.1 cm)	
	Remote Control Head	2.1" x 7.15" x 3.1" (5.3 cm x 18.2 cm x 7.9 cm)	
Weight:	Radio	5 lbs. 4 oz. (2.38 kg)	
	Remote Control Head	1 lb. 1 oz. (0.48 kg)	
Case	Metal—black		
Temperature Range	–30°C to +60°C		
Current Drain @ 13.8V:	Standby	0.6 A	
	Received @ Rated Audio	2.7 A	
	Transmit @ Rated Power	13.2 A	
Channel Spacing	12.5, 15, 25, 30 kHz	12.5, 25 kHz	12.5, 25 kHz
Voice Digital Mode:	Voice Coding	IMBE™ 4.4 kbps	
	Frame Re-sync Interval	180 msec	
	Error Correction Method	RS, Golay, Hamming	
FCC Type Acceptance Number	ATH2425317	ATH2425330	ATH2425384
Canada	933 195 573A	—	933 195 671A

RECEIVER Typical Performance Specifications (Measurements per TIA 603 Standards)

Sensitivity: Digital Mode: 5% BER**	0.35 µV		
Analog Mode: 12 dB SINAD	0.35 µV		
Selectivity	–75 dB		
Spurious & Image Rejection	–75 dB		
Intermodulation	–75 dB	–77 dB	–73 dB
Audio Output Power	12W		
Audio Distortion (at 1000 Hz)	<3%		
Frequency Stability (–30°C to +60°C)	±2.5 ppm	±2.5 ppm	±1.5 ppm
Maximum Frequency Separation	Full bandsplit		

TRANSMITTER Typical Performance Specifications (Measurements per TIA 603 Standards)

RF Power Output	10W–50W variable	7W–15W variable	10W–35W variable
Spurious & Harmonic Emissions	–70	–70	–60
FM Hum & Noise (Wideband)	–45 dB		
Emission Designators	8K10F1E, 11K0F3E, 16K0F3E, 20K0F1E		8K10F1E, 14K0F3E 16K0F3E, 20K0F1E
Audio Distortion (at 1000 Hz)	<3%		
Audio Response (1000 Hz ref.)	300–3000 Hz		
Frequency Stability (–30°C to +60°C)	±2.5 ppm	±2.5 ppm	±1.5 ppm
Modulation Limiting:			
Wideband Analog	5 kHz		5 kHz
Narrowband Analog	2.5 kHz		2.5 kHz
Maximum Frequency Separation	Full bandsplit		

** Measured in digital mode per TIA 102.CAAA and TIA 102.CAAB standards.

ENVIRONMENTAL SPECIFICATIONS				
Environment	Mil Spec 810C	Mil Spec 810D	Mil Spec 810E	Mil Spec 810F
	Method Procedure	Method Procedure	Method Procedure	Method Procedure
Low Pressure	500.1 I	500.2 I	500.3 II	500.4 II
High Temp.	501.1 I, II	501.2 I, II	501.3 I, II	501.4 I, II
Low Temp.	502.1 I	502.2 I	502.3 I	502.4 I
Temp. Shock	503.1 I	503.2 I	503.3 I	503.4 I
Solar Radiation	505.1 I	505.2 I	505.3 I	505.4 I
Rain/Blow/Rain	506.1 I, II	506.2 I, II	506.3 I, II	506.4 I, II
Humidity	507.1 II	507.2 II(5)	507.3 II(5)	
Salt Fog	509.1 I	509.2 I	509.3 I	
Dust and Sand	510.1 I	510.2 I	510.3 I, II	510.4 I, II
Vibration	514.2 VIII(W)	514.3 I(10)	514.4 I(10)	514.5 I(24)
Shock	516.2 I, II, V	516.3 I, IV, VI	516.4 I, IV, VI	516.5 I, IV, VI

ENCRYPTION OPTIONS

Supported Encryption Algorithms	DES, DES-XL™, DES-OFB, AES
Encryption Algorithm Capacity	4 minimum
Encryption Keys/Radio	16 Common Key Reference (CKR) 16 Physical Identifier (PID)
Encryption Frame Re-sync Interval	P25 CAI 360 msec
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB — Cipher Feedback XL — Counter Addressing OFB — Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal pseudorandom generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2*, FIPS 197

* Pending

ACCESSORIES

- Weather Resistant External Speaker
- Weather Resistant Noise Cancelling Microphone
- Motorcycle Mounting Bracket



Motorcycle Mounting Bracket with Mic Hang-Up and WR Noise Cancelling Mic



Rear View of Motorcycle Mounting Bracket with Mic Hang-Up



5300 Series

HANDHELD CONTROLLER

ANALOG/DIGITAL MOBILE RADIO

Handheld Controller

The Handheld Controller (HHC) is a discreet alternative for the traditional, full-featured remote control head of the EFJohnson® 5300 Series mobile. Designed primarily for use by law enforcement agencies and surveillance missions, the HHC gives you full radio functionality right in the palm of your hand. The Handheld Controller is available with any of the remote-mount 5300 models, eg. 53x8 or 53x6 in VHF, UHF, and 800 MHz frequencies.

Features:

- LCD provides all display functions of the 5300 control head (dash or remote)
- Multi-level display and keypad backlighting (off, low and high)
- Multi-function LED indicator
- Replicates all control functions (six programmable function buttons) of the 5300 Series mobile
- Volume up/down buttons
- Channel/zone select buttons

Adds Additional Functionality to the 5300 Series mobile:

- Dedicated emergency button
- Dedicated encryption button
- Numeric keypad

Optional Interface Box:

- Provides line level recording interface for transmit and receive audio
- Programming and encryption keyload interface
- Simplifies external speaker wiring

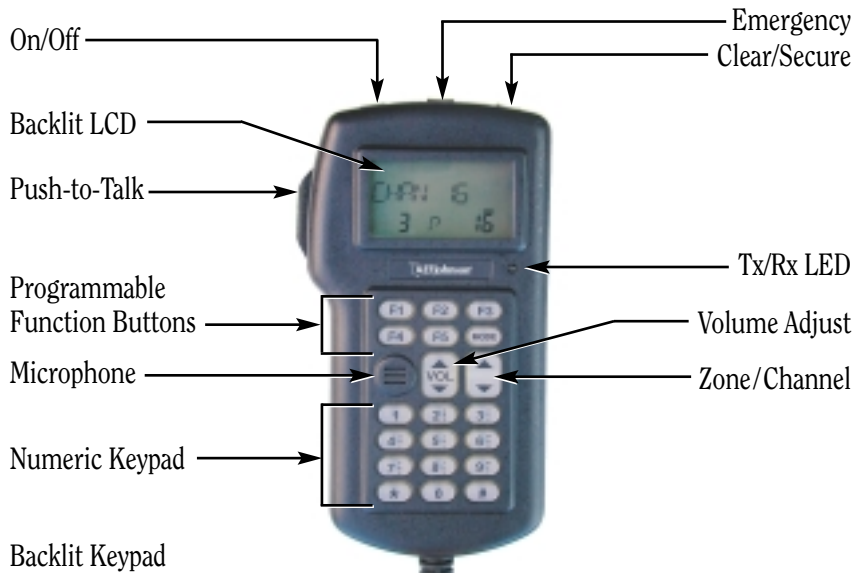


5300 SERIES

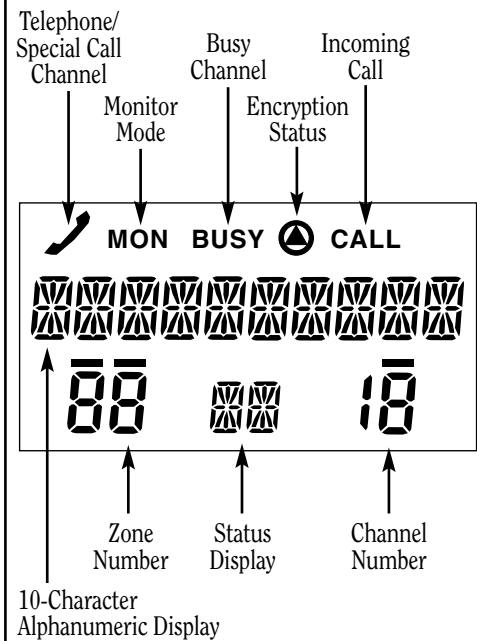
ANALOG/DIGITAL MOBILE RADIO

All Specifications are typical and subject to normal manufacturing tolerances.

HANDHELD CONTROLLER CONTROLS



LED DISPLAY



Handheld Controller with 5300 100-watt trunk-mount mobile and junction box; pictured with external speaker (PN 250-0151-005), which is ordered separately.



5300 Series

TRANSIT MOBILE RADIO SYSTEM

PUBLIC ADDRESS INTERFACE SYSTEM KIT



The EFJohnson® Transit Mobile Radio System Kit is an integrated communications and information solution that addresses mission-critical safety and security requirements of the public transportation market. The radio system will enhance communications capabilities by adding a direct connection and critical interoperability between the transportation department and surrounding public safety agencies. During an emergency or critical situation, you can be assured that the communications link to emergency services is always accessible and reliable.

5300 SMARTNET® trunked radio system.

Interoperability with public safety agencies.

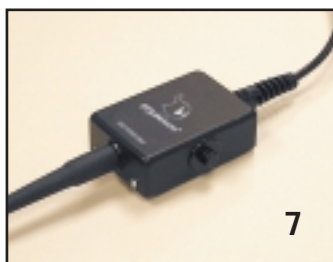
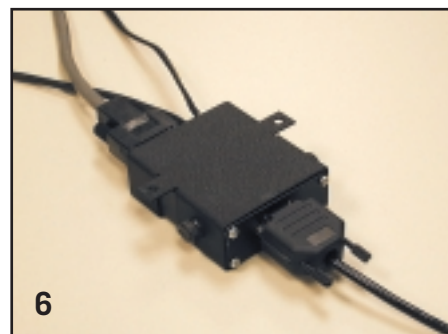
Emergency button alerts dispatch center that emergency assistance is required.

Superb voice quality and clarity.

Provides up-to-date and confidential information to dispatchers regarding current operations, making it possible to make on-the-spot critical decisions without compromising the efficiency of operations.

Allows the operator to quickly broadcast greetings, upcoming bus stops, and safety messages to passengers.

1. 5300 Mobile (sold separately)
2. Remote Amp Interface Box
3. Remote Radio Control Head
4. 3-Watt External Speaker
5. 25' Remote Cable
6. 25' Audio Interface/Remote Head Interface Cable
7. Local Audio Interface Box
8. PTT Adapter Box
9. Handset with Cradle
10. Headset



5300 TRANSIT MOBILE RADIO SYSTEM KIT 250-5300-900

1. Remote Amp Interface Box

Connects radio to public address system and remote control head. Amplifies up to 15 watts for external PA interface.

2. Remote Radio Control Head

Compact design enables easy control from front of the vehicle, while the 5300 radio is at a different location.

3. 3-Watt External Speaker

Environmentally sealed. Meets Mil 810 specs for shock, vibration, and driven rain. Provides three watts of audio power for noisy environments.

4. 25' Remote Cable

Provides connection between the Remote Control Head and the Remote Amp Interface Box.

5. 25' Audio Interface/Remote Head Interface Cable

9-pin 25-foot cable connects the Local Audio Interface Box and the Remote Head Interface Box.

6. Local Audio Interface Box

Connects external speaker box, armored cable handset, and push-to-talk headset.

7. PTT Adapter Box

Provides push-to-talk function for the headset. Includes mounting bracket.

8. Handset with Cradle

Unamplified with dynamic transmitter and 3.5' straight armored cable. PTT button on handset.

9. Headset

Ultra-lightweight headset with boom microphone.

10. Lockable Mounting Bracket

Includes mounting tray, two keys, and all necessary hardware.

PC CONFIGURE™

PROGRAMMING SOFTWARE

5100 SERIES

5300 SERIES

EFJohnson's PC Configure™ software is the most user-friendly programming software for public safety and service radio users. Program all of your EFJohnson® mobile and portable radios quickly and easily with the same software package. With minimal setup time or training, PC Configure gives you the flexibility to program your EFJohnson® 5100 Series Portable and 5300 Series Mobile radios for any encryption or system type installed on the radio.

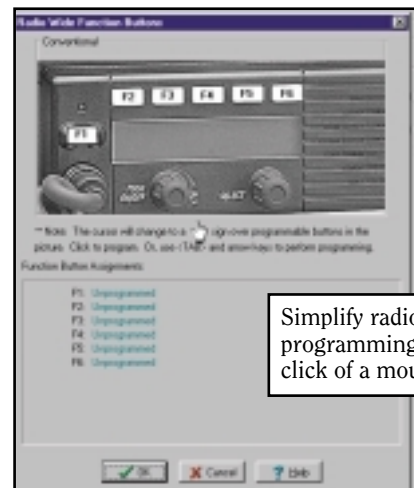
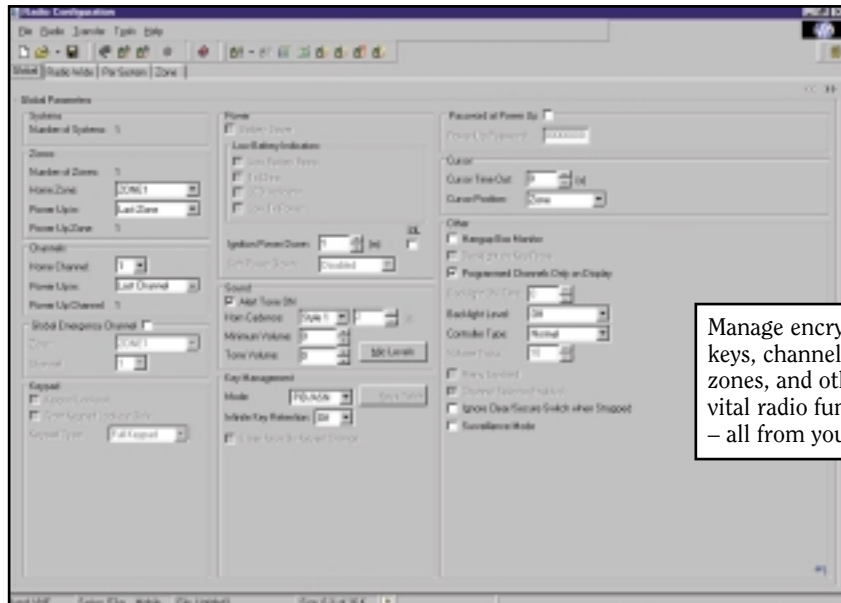
PC Configure is a Windows®-based application. With its intuitive and unique graphical display, PC Configure allows you to re-flash radios much faster than any other radio programming software. PC Configure's "remember" function stores previously programmed parameters (such as software version or options) and recalls them for future use.

Advantages

- Minimize your learning curve with an intuitive graphical interface
- Configure mobile and portable radios with a single software package
- Switch between radio and system parameters, and program zone and channel properties with the click of a mouse
- Program your radios in analog conventional, Multi-Net®, Project 25 conventional and trunking, and SMARTNET®/SmartZone®
- Use one template to program multiple radios – simply change unit IDs and download the file to each radio

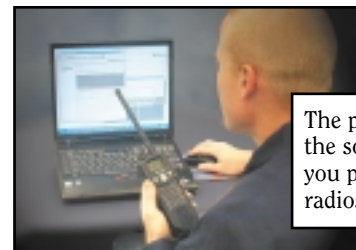
Computer Requirements

800 MHz Pentium or greater
128 MB RAM
40 MB hard disk space
CD-ROM drive



EFJohnson

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.



SMA

SUBSCRIBER MANAGEMENT ASSISTANT

The EFJohnson® Subscriber Management Assistant (SMA) is a versatile tool, but its predominant function is for fast and easy encryption key loading. Since the SMA uses PDA technology in a ruggedized case, it can be used in almost any environment. The SMA connects to an EFJohnson or Motorola® radio via a serial interface. All configuration and modifications are completed through the serial interface. It uses the FIPS validated SEM security algorithms for all security functions, including AES and DES. With its Microsoft Windows® based graphical user interface, the SMA will have you configuring your radios right away.

The SMA enables you to:

- Generate a random DES Key or AES Keys for download to the EFJohnson and Motorola portable radios that are in CKR mode
- Enter your own AES or DES key for download into a portable radio
- Use the Microsoft SQL CE database for storage of security parameters such as AES and DES keys
- Read radio key set information
- Erase all keys from a radio
- Retrieve hardware revision information from the radio
- Select a key set and make that key set active, modify and set KEK parameters, set KMF parameters on the radio, and set or modify RSI parameters
- Create a new database containing security parameters such as AES and DES keys
- Delete or modify an existing database containing security parameters such as AES and DES keys
- Encrypt all keys stored in the SQL CE using a 256-bit AES key



For keyloading functionality, the SMA connects to radios via a special keyloader cable.



Mobile Pricing



EFJohnson®

PRICE LIST

ANALOG/DIGITAL MOBILE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®

To determine the 5300 model to order, choose ONE option from each box (with the exception of the Software Control Option box). Carry the option numbers to the bottom of the page where you will build the model string. The model string will be used for ordering. **To determine the price**, carry the price of the base model and each option to the column at the right. Total all prices at the bottom to determine the radio list price.

SELECT BASE MODEL: (Select one) Dash-Mount Base Model: (Includes radio, 512 channels/talkgroups, microphone, 22 ft. power cable and hardware kit, accessory wire kit, and standard mounting bracket.)		PRICE 5317 = VHF 50W, 136-174 MHz\$ 2,018 5325 = VHF 100W, 146-174 MHz2,427 5337 = UHF 15W, 403-470 MHz2,018 5367† = UHF 15W, 380-470 MHz2,018 5387 = 800 MHz 35W, 806-870 MHz2,018	ENTER & ADD PRICES OF SELECTED BASE MODEL & OPTIONS FROM BOXES ON THE LEFT:
Remote-Mount Base Model: (Includes radio, 512 channels/talkgroups, 22 ft. power cable and hardware kit, accessory wire kit, standard mounting bracket, and 17' remote cable.)		PRICE 5318 = VHF 50W, 136-174 MHz\$ 2,018 5326 = VHF 100W, 146-174 MHz2,427 5338 = UHF 15W, 403-470 MHz2,018 5368† = UHF 15W, 380-470 MHz2,018 5388 = 800 MHz 35W, 806-870 MHz2,018	
1	SELECT CONTROL HEAD OPTIONS: (Select one) Dash-Mount Options: 1 = Dash-Mount\$ 199 4 = Dash-Mount Control with Remote Control Head (Factory installed, includes one remote control head, microphone, and mounting bracket.) 888 Remote-Mount Options: 0 = Remote Control Head (includes microphone)\$ 778 5 = Handheld Controller (includes Junction Box and cabling. Requires remote speaker 250-0151-005. Must order separately.)999 6 = Double Control Head (includes two remote control heads directly attached to the remote mount radio, two microphones, and two mounting brackets)1,556 7 = Transit Mobile Radio System (Includes kit 250-5300-900) NOTE: This internal public address option is not compatible with public safety accessories (siren). It is intended for use in public transit applications.1,975		\$
	2	SELECT ADDITIONAL HARDWARE OPTIONS: (Select one) 1 = No Additional Hardware\$ N/C 2 = Siren Control Cable (597-2002-231) (Connects to Siren Kit 250-5300-100 and other siren accessories)75 3 = Standard External Interface Cable (597-2002-282) with female DB-9 connector (Recommended by EFJohnson for Data Interface)80 4 = Cable (597-2002-245) with female DB-25 connector for special/custom applications (Not supported by EFJohnson)188 5 = Cable (597-2002-249) with female DB-15 connector for special/custom applications. (Not supported by EFJohnson)205	
3		PROTOCOL: (Select one) 1 = Analog FM\$ 300 2 = Project 25 Digital CAI (Common Air Interface) (Includes #1 Analog FM enabled) ... 510	
	4	SYSTEM OPTIONS: (Select one) 0 = Conventional\$ 198 1 = SMARTNET® II Trunking (Includes #0 Conventional enabled)594 2 = SmartZone® Trunking (Includes #1 SMARTNET Trunking, #0 Conventional, and STAR [SmartZone Transfer Area Roaming] enabled)891 3 = Project 25 Trunking (Includes #2 SmartZone, #1 SMARTNET, #0 Conventional, and STAR enabled)1,149	
5		SOFTWARE CONTROL OPTIONS: 6 (Continued on page SN-6.) CARRY MODEL NUMBERS AND PRICES FROM PAGE SN-6 TO APPROPRIATE BOXES ON THIS PAGE.	
	<div style="display: flex; align-items: center; justify-content: space-between;"> <div> <div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div> <div style="font-size: 24px;">-</div> <div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div> <div style="font-size: 24px;">-</div> <div style="display: flex; gap: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div> </div> <div style="margin-top: 5px;"> (List in numerical order. List only Software Control Options requested from page SN-6. Leave remaining boxes blank.) </div> </div> <div style="display: flex; align-items: center; justify-content: flex-end;"> <div style="margin-right: 20px;"> PRICE OF RADIO: <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div> </div> <div style="font-size: 24px;">→</div> <div style="margin-left: 20px;"> \$ </div> </div>		

†Federal customers only.

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EFFECTIVE JULY 16, 2004
Supersedes March 24, 2004
Prices subject to change without notice.

SN-5

PRICE LIST

ANALOG/DIGITAL MOBILE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®

CONTINUED

SOFTWARE CONTROL OPTIONS: (May select up to four options)

05	= DES / P25 DES-OFB encryption	\$ 550
06	= DES / DES-XL™ / P25 DES-OFB encryption	750
07	= DES / P25 DES-OFB / AES encryption	750
08	= DES / DES-XL / P25 DES-OFB / AES encryption	950
11	= Project 25 OTAR Conventional and Trunking	750
13	= Project 25 Data Conventional	135
14	= Project 25 Data Trunking* (Requires System Option #3 P25 Trunking)	135
50	= Zone Fail-Site Lock (Requires System Option #2 SmartZone or higher)	150

ENTER & ADD PRICES

(Up to four software control options per radio may be ordered.)

\$ \$ \$ \$ \$

Total Software Control Options

Copy price of all Software Control Options to page SN-5, Section 6, to calculate total radio price.

\$

					-				-			-				
--	--	--	--	--	---	--	--	--	---	--	--	---	--	--	--	--

(List in numerical order. List only Software Control Options requested. Leave remaining boxes blank.)

Copy Software Control Option numbers
to page SN-5 to complete the model string number.

* Future option.

NOTE: As a result of the current P25 AES OTAR standard not being NIST certified, any order to EFJohnson for Software Control Options 07, 08, and 11 simultaneously, would require a waiver from the customer deeming FIPS 140-2 approval not applicable.

PRICE LIST

ANALOG/DIGITAL MOBILE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE® — STATE & LOCAL APPLICATIONS

5300 – MOTORCYCLE & PUBLIC WORKS

To determine the 5300 model to order, choose ONE option from each box (with the exception of the Software Control Option box). Carry the option numbers to the bottom of the page where you will build the model string. The model string will be used for ordering. **To determine the price**, carry the price of the base model and each option to the column at the right. Total all prices at the bottom to determine the radio list price.

column at the right.

total price at the bottom of the column list price.

SELECT BASE MODEL: (Select one)		
Dash-Mount Base Model: (Includes radio, 512 channels/talkgroups, microphone, 22 ft. power cable and hardware kit, accessory wire kit, and standard mounting bracket.)		
		PRICE
5319 = VHF 50W, 136-174 MHz		\$ 2,018
5339 = UHF 15W, 403-470 MHz		2,018
5369 = UHF 15W, 380-470 MHz†		2,018
5389 = 800 MHz 35W, 806-870 MHz		2,018
Motorcycle-Mount Base Model: (Includes radio, 512 channels/talkgroups, noise cancelling weather-resistand mic, attenuated weather-resistant speaker, power cable and hardware kit, accessory wire kit, motorcycle mounting bracket, and 8' remote cable.)		
		PRICE
5310 = VHF 50W, 136-174 MHz		\$ 2,118
5330 = UHF 15W, 403-470 MHz		2,118
5360 = UHF 15W, 380-470 MHz†		2,118
5380 = 800 MHz 35W, 806-870 MHz		2,118
SELECT CONTROL HEAD OPTIONS: (Select one)		
Dash-Mount for Public Works Options:		
1 = Dash-Mount		\$ 199
Motorcycle Options:		
0 = Remote Control Head for motorcycles		\$ 778
SELECT ADDITIONAL HARDWARE:		
1 = No Additional Hardware		\$ N/C
PROTOCOL: (Select one)		
1 = Analog FM		\$ 300
2 = Project 25 Digital CAI (Common Air Interface) (Includes #1 Analog FM enabled)		.510
SYSTEM OPTIONS: (Select one)		
0 = Conventional		\$ 198
1 = SMARTNET® II Trunking (Includes #0 Conventional enabled)		.594
2 = SmartZone® Trunking (Includes #1 SMARTNET Trunking, #0 Conventional, and STAR [SmartZone Transfer Area Roaming] enabled)		.891
3 = Project 25 Trunking (Includes #2 SmartZone, #1 SMARTNET, #0 Conventional, and STAR enabled)		.1149
SOFTWARE CONTROL OPTIONS: (May select up to four options)		
05 = DES / P25 DES-OFB encryption		\$ 550
06 = DES / DES-XL™ / P25 DES-OFB encryption		.750
07 = DES / P25 DES-OFB / AES encryption		.750
08 = DES / DES-XL / P25 DES-OFB / AES encryption		.950
11 = Project 25 OTAR Conventional and Trunking		.750
13 = Project 25 Data Conventional		.135
14 = Project 25 Data Trunking* (Requires System Option #3 P25 Trunking)		.135
50 = Zone Fail-Site Lock (Requires System Option #2 SmartZone or higher)		.150

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*** Future option**



EFFECTIVE JULY 16, 2004
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SN-7

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ACCESSORIES

Configuration	Part Number	Price
Audio Accessories and Key Caps		
Standard microphone	250-0740-310	\$ 100
Desktop microphone	589-0012-021	115
DTMF environmentally-sealed WR805 microphone	587-9650-015	230
DTMF standard microphone	589-0016-028	199
Noise cancelling, weather resistant microphone	589-0016-592	145
5" remote speaker, environmental sealed	250-0151-006	54
Motorcycle attenuated 5" speaker, environmental sealed	250-0151-015	74
Handheld Controller 5" remote speaker, environmental sealed	250-0151-005	54
Key cap kit	587-5300-001	30
Cables/Wiring		
Hardware and 22' DC cable	023-9750-010	\$ 40
Accessory wire kit (required for horn honk and ignition sense)	023-9750-011	18
Mounting Hardware		
Standard mounting bracket	023-9750-012	\$ 15
Lockable mounting tray	585-7000-185	90
Remote control head mounting bracket	017-2226-050	15
Mounting bracket for 100W radio	017-9700-009	20
Motorcycle mounting bracket with microphone hang-up	250-5300-083	40
Antenna		
800 MHz roof-mount antenna	585-1155-011	\$ 58
Roof mount 1/4-wave whip tunable from 136 MHz to 870 MHz. (Includes detached male N-connector to be soldered by installer. Requires 3/4" mounting hole. Installation instructions included. No adapter required.)	501-0012-001	52
Magnetic mount 1/4-wave whip tunable from 136 MHz to 870 MHz. (Soldered male N-connector installed at factory. Removable rubber protective boot included.)	501-0012-011	89
Remote-Mount Accessories		
Remote radio control head, includes mounting bracket	023-5300-081	\$ 750
Handheld Controller (HHC) kit (Includes HHC, junction box, cable. Requires remote speaker 250-0151-005. Must order separately.)	250-5300-101	1,208
Transit Mobile Radio System kit	250-5300-900	1,800
17' remote cable	597-2002-262	250
50' remote cable	597-2002-263	399
HHC 17' remote cable	597-2002-267	199
Motorcycle 8' remote cable	597-2002-259	250
Dash-Mount Accessories		
5300 Remote Control Head kit, single or dual (includes RCH, mounting bracket, blank radio front panel, cabling)	250-5300-001	\$ 999
Siren Control Accessories		
Siren controller kit (without loudspeaker)	250-5300-100	\$ 999
Siren loudspeaker (Model TS100 for lightbar installation)	585-5300-007	250
Siren loudspeaker (Model MC100, compact for behind grill installation)	585-5300-009	300
Siren wire kit	023-5300-101	50

Continued on next page.

ACCESSORIES (CONT.)

Configuration	Part Number	Price
Control Station Accessories 15 amp 120 volt power supply 15 amp 230 volt power supply	250-4001-202 250-4001-204	\$ 295 295
Subscriber Management Assistant <i>EFJohnson's handheld PDA device that currently supports encryption key loading functionality.</i> SMA (Includes HP iPAQ h5550 PocketPC PDA; PDA-DB9 adapter cable; ruggedized PDA case; PDA cradle; PDA charger; charger adapter; operating manual; Microsoft® Active Sync OS; encryption features and software: AES, DES, DES-XL™, DES-OFB, CKR/SLN) Mobile Key Loader Cable	250-5000-945 023-5000-950	\$ 3200 250
Encryption Accessories for 3rd Party Keyloading Systems Key Loader cable	585-5000-938	\$ 275
Programming Accessories PCConfigure programming kit (software, cable, manual) for Windows Remote Programming Interface box (RPI Box) Radio programming cable Interface cable to connect RPI to computer, DB-9 M-F Programmer adapter for HHC PCTune tuning software PCConfigure programming software	250-5000-004 023-5300-000 023-5300-005 597-5900-002 023-5300-140 023-9998-499 023-9998-488	\$ 495 278 99 50 200 275 350
Factory Services 1-year extended warranty 2-year extended warranty 3-year extended warranty	299-0045-016 299-0045-012 299-0045-028	\$ 31 55 117
Manuals Quick Reference Guide Operator's manual (full detail on CD) Service manual (on CD) Training CD	002-5300-000 002-5300-009CD 001-5300-008CD 299-TRNG-5300	\$ 14 14 42 50

Portables



EFJohnson®

5100 Series

VHF
UHF
800 MHz

ANALOG/DIGITAL PORTABLE RADIO

- APCO Project 25 Compatible – Trunked and Conventional
- SMARTNET® and SmartZone®
- Analog FM
- Encryption

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.

EFJohnson designed the 5100 series Analog/Digital Encrypted Portable Radio to be rugged, lightweight, and versatile. It ensures seamless communications in a powerful software-defined unit that is easy on your body and your budget. Whether you need a radio to perform on a single-protocol system or part of many systems with different protocols, the 5100 is the solution.

The 5100 series meets the requirements of the NTIA Narrowband Mandate, and the 5100 series is compliant with FCC rules for narrowband operation. The 5100 meets narrowband requirements for both analog and Project 25 digital formats, and supports mixed-mode operation. EFJohnson supports legacy systems, while providing a seamless transition to narrowband operation.

Available in VHF, UHF, and 800 bands, the 5100 serves the needs of federal, state and local government, and public service customers.

Multiple Protocol Compatibility:

– **Project 25 CAI (Common Air Interface)** enables users to communicate with other Project 25 compatible radios. The 5100 supports Project 25 trunked and conventional communications, as well as Motorola® ASTRO® trunking.

– **SMARTNET® II and SmartZone® Trunking Protocols** are supported.

Encrypted Communications for wide-band legacy systems and narrowband operation. DES and DES-XL™ enable secure voice communications in wide-band channels; Project 25 DES-OFB and AES encryption provides secure communication in narrowband channels.

Multiple System Select is an advanced feature that enables the user to simply change the communications protocol from analog to digital by pressing a button. The 5100 provides for up to 512 channel/talkgroups.

Over-The-Air-Rekeying (OTAR) option enables encryption keys and other related key management messages to be securely sent through the air from a key management facility (KMF).

Field Programmable Capability provides National Telecommunications and Information Administration (NTIA) agencies the ability to reprogram conventional frequencies, CTCSS, DCS, and talkgroups into the radio's memory.

Backward Compatibility provides the flexibility to communicate in both narrow and wideband analog channels, in addition to narrowband digital. **Forward Compatibility** is provided via a scalable design that allows new features and applications to integrate into the existing radio platform.

Alphanumeric Display provides a large, LCD backlit display that is easy to read from any angle.

DTMF Compatibility enables the user to operate remote control devices or access telephone interconnect systems.



Ergonomically-Designed Rotary Knobs allow easy access and help the user distinguish between the talkgroup/channel knob and volume knob.

Keypad enables users to call individual radios, groups or fleets.

PC Programmability: Program an unlimited number of radios with the click of a mouse, using EFJohnson's PC Configure™ application – support both mobile and portable platforms in a single configuration software package.

Factory Mutual Approved intrinsically safe for use in hazardous areas.



Project 25
Trunking

SMARTNET®
SmartZone®
Digital

Project 25
Conventional

SMARTNET®
SmartZone®

Conventional

5100 SERIES

ANALOG/DIGITAL PORTABLE RADIO



All Specifications are typical and subject to normal manufacturing tolerances.

MODEL NUMBER	511X	512X/514X	518X
GENERAL	VHF	UHF	800 MHz
Frequency Range	136–174 MHz	380–470 MHz 403–470 MHz 450–512 MHz	806–870 MHz
RF Power Output	5W/1W	4W/1W	3W/1W
Zones/Channels	Up to 512 Talkgroups/Channels		
Voice Digital Mode	IMBE™ 4.4 kbps		
Voice Coding	180 msec.		
Frame Re-sync Interval	RS, Golay, Hamming		
Error Correction Method	7.2 V		
Input Voltage	6.7" x 2.52" x 1.9" (6.4 cm x 17.0 cm x 4.8 cm)		
Dimensions (w/o antenna) (HxWxD)	24 oz. (675 g)		
Weight (with standard battery)	Polycarbonate—black, yellow, orange		
Case	–30°C to +60°C		
Temperature Range	12.5 kHz, 25 kHz, 30 kHz	12.5 kHz, 25 kHz	12.5 kHz, 25 kHz
Channel Spacing	ATH242510	ATH2425130 ATH2425140	ATH2425180
FCC Type Acceptance Number	933196846A	966B-2425130 933B-2425140	933B-2425180
Canada			

RECEIVER Typical Performance Specifications (Measurements per TIA 603 Standards)

Sensitivity	Digital Mode: 5% BER**	0.25 µV
	Analog Mode: 12 dB SINAD	0.25 µV
Selectivity		–75 dB
Spurious & Image Rejection		–75 dB
Intermodulation	–78 dB	–77 dB
Audio Output Power		500 mW
Audio Distortion (at 1000 Hz)		2%
Frequency Stability (–30°C to +60°C)	±2.0 ppm	±2.0 ppm
Maximum Frequency Separation		Full bandsplit

TRANSMITTER Typical Performance Specifications (Measurements per TIA 603 Standards)

RF Power Output	5W/1W	4W/1W	3W/1W
Spurious & Harmonic Emissions	–70	–70	–60
FM Hum & Noise (Wideband)		–45 dB	
Emission Designators	16K0F3E, 11K0F3E, 8K10F1E	16K0F3E, 14K0F3E, 8K10F1E	
Audio Distortion (at 1000 Hz)		2%	
Audio Response (1000 Hz ref.)		300–3000 Hz	
Frequency Stability (–30°C to +60°C)	±2.0 ppm	±2.0 ppm	±1.5 ppm
Modulation Limiting: Wideband Analog		5 kHz	
Narrowband Analog		2.5 kHz	
Maximum Frequency Separation		Full bandsplit	

** Measured in digital mode per TIA 102.CAAA and TIA 102.CAAB standards.

BATTERIES

Battery Type	Dimensions (HxWxD)	Weight	Part Number	Approx. Life (5/5/90) (With Encryption/Without Encryption)
Extra-High Capacity NiMH	6.0" x 2.3" x 0.85"	0.81 lbs	589-5100-360	12 hrs/13 hrs
Extra-High Capacity NiMH FM	6.0" x 2.3" x 0.85"	0.81 lbs	589-5100-361	12 hrs/13 hrs
Alkaline Battery Clamshell	7.2" x 2.6" x 2.0"	0.98 lbs (w/12 AA batt.)	250-5100-280	14-16 hrs/16-18 hrs

ENVIRONMENTAL SPECIFICATIONS

Environment	Mil Spec 810C	Mil Spec 810D	Mil Spec 810E	Mil Spec 810F
	Method Procedure	Method Procedure	Method Procedure	Method Procedure
Low Pressure	500.1 I	500.2 II	500.3 II	500.4 II
High Temp.	501.1 I, II	501.2 I, II	501.3 I, II	501.4 I, II
Low Temp.	502.1 I	502.2 I, II	502.3 I, II	502.4 I, II
Temp. Shock	503.1 I	503.2 I	503.3 I	503.4 I
Solar Radiation	505.1 I	505.2 I	505.3 I	505.4 I
Rain/Blow/Rain	506.1 I, II	506.2 I, II	506.3 I, II	506.4 I, II
Humidity	507.1 I	507.2 II, III	507.3 II, III	
Salt Fog	509.1 I	509.2 I	509.3 I	
Dust and Sand	510.1 I	510.2 I	510.3 I	510.4 I
Vibration	514.2 VII, VIII	514.3 I(8)	514.4 I(8)	514.5 I(24)
Shock	516.2 I, II, V	516.3 I, IV, VI	516.4 I, IV, VI	516.5 I, IV, VI

ENCRYPTION OPTIONS

Supported Encryption Algorithms	DES, DES-XL™, DES-OFB, AES
Encryption Algorithm Capacity	4 minimum
Encryption Keys/Radio	16 Common Key Reference (CKR) 16 Physical Identifier (PID)
Encryption Frame Re-sync Interval	P25 CAI 360 msec
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB – Cipher Feedback XL – Counter Addressing OFB – Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal pseudorandom generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

ACCESSORIES

- Vehicular, Single & Multi-Unit Rapid Chargers
- Speaker-Microphone
- Public Safety Speaker-Mic
- Earphone
- Lightweight Headset
- Leather Cases, Belt Clip
- Programming Accessories

FACTORY MUTUAL APPROVALS

FM-approved models, batteries, and accessories as indicated on price pages.

Intrinsically Safe

Class I	Division 1 An area where there is or could be an explosive atmosphere most of the time in normal conditions.	C Ethylene [†] D Propane, Methane
Class II		E Conductive metal F Carbonaceous material coal, coke dust G Grain dust and flour
Class III	Division 1 Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Ignitable fibers or flyings

Non-Incendive

Class I	Division 2 An area where an explosive atmosphere exists only as a result of a fault.	A Acetylene B Hydrogen C Ethylene [†] D Propane, Methane
---------	--	--

[†] Group C Ethylene **NOT** FM approved for models with DES-XL encryption.



5100 Series

ACCESSORIES

Value-Added Features & Accessories

High Visibility Housing



Customers have been asking for it, now we have it! The 5100 portable with high visibility housing.

An ideal solution for fire departments, public safety, construction, and other applications where a bright, easy-to-find radio is a real plus.

The high visibility housing is introduced in yellow or orange

polycarbonate and maintains the same high Public Safety standards of durability as our standard black housing.



5100 SERIES ACCESSORIES

Speaker Microphone

*...ideal for
public safety*

The 5100 Alkaline Battery Clamshell Assembly

...when recharging isn't possible.



Our solution for the wildland and forest fire service, the Alkaline Battery Clamshell. The Alkaline Battery Clamshell is a substitute for the standard battery pack in applications where a battery charger is unavailable. The Clamshell holds twelve AA size alkaline batteries in a compact package.



**Alkaline Battery Assembly
Part Number 250-5100-280**



The Public Safety Speaker Microphone (part number 589-0015-058) is specially designed for fire and police application, although it can serve for any department where better coverage is desirable. The 800 MHz antenna, which is located on the microphone, ensures better signal as it is not guarded by the body of its user.

A volume knob adds to the convenience of this accessory.

Antenna must be ordered separately.

1. 800 MHz 1/2-Wave Antenna (501-0105-013)
2. 800 MHz 1/4-Wave Antenna (501-0105-012)

A full line of accessories is available for the 5100 Multi-Protocol Portable:

- Single- and Multi-Unit Rapid Chargers
- Alkaline Battery Clamshell Assembly
- Extra-High Capacity Battery, standard and intrinsically safe
- Public Safety Speaker-Microphone (800 MHz)
- Speaker-Microphone
- Leather Cases
- Lightweight Headset
- Programming Accessories
- Battery Eliminator
- Belt Clip
- Earphone
- Vehicular Charger



7700 Series

CONVENTIONAL/SMARTNET®/SMARTZONE® PORTABLE

7780 – 800 MHz
7781 – 800 MHz

SMARTNET®/SmartZone® Compatible Analog Trunked Portable Radio

The 7700 Series 800 MHz portable radio is truly state-of-the-art, delivering 3 watts of RF power for maximum coverage. It is a multi-mode radio which can be simultaneously programmed with up to 256 channels (with the correct options) in conventional analog wide, conventional analog narrow, trunked SMARTNET® II, or trunked SmartZone®. The 7780 is backed by a full 1-year warranty and meets MIL STD 810 C/D specifications for shock and vibration.

Standard Features

- 256 Modes
- Six Programmable Buttons
- 1300mAHr Battery
- FM Approved (7781 Version)
- Belt Clip
- Antenna

Conventional Features

- Repeater Talkaround
- PL/DPL/Carrier Squelch
- DTMF Tone Generator (full keypad)
- Dual Priority Scan
- Scan (auto, pre-programmed, operator selectable scan)

Type II Trunking Features

- 20 Trunked Systems
- Talkgroup Calls
- PTT-ID
- Call Alert™ Decode/Private Conversation™ Decode
- Call Alert Encode
- Dual Mode Scan
- Failsoft by Talkgroup
- Telephone Interconnect
- Telephone Interconnect Encode
- Selective Radio Inhibit
- Priority Monitor Scan
- Emergency Alarm/Call
- Emergency with Voice to Follow
- Dynamic Regrouping
- RX Site Indicator
- Emergency Receive Indicator
- Status/Message
- Out of Range Indicator
- SmartZone Adjacent Control Channel
- SmartZone Full Spectrum Scan
- SmartZone Voice on Control
- SmartZone Automatic Site Registration
- SmartZone RSSI Operation
- SmartZone Busy Override
- SmartZone Preferred Site
- SmartZone Forced Site Search
- SmartZone Site Lock/Unlock



SMARTNET®
SmartZone®

Conventional

7700 SERIES

CONVENTIONAL/SMARTNET®/SMARTZONE® PORTABLE

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #		7780/7781
GENERAL		800 MHz
Frequency Range	Transmit	806–824 MHz
	Receive	851–869 MHz
	Talkaround	851–869 MHz
RF Power Output		High: 3W/Low: 1W
Systems/Groups		Any combination of systems or groups up to 256
Battery Capacity		1300 mAh
Input Voltage		7.5 VDC (nominal)
Dimensions (HxWxD)		6.5" x 2.2" x 1.2" with battery (166mm x 56mm x 30mm)
Weight		18 oz (515 g) with battery
Temperature Range		–30°C to +60°C
Channel Spacing		25 kHz
FCC Type Acceptance Number		ATH2428150-2
FCC Compliance		Parts 15, 90
Canada		933195564A
RECEIVER (Measurements per TIA Standards)		
Sensitivity: 12 dB SINAD		0.35 µV
Selectivity		–68 dB
Spurious & Image Rejection		–68 dB
Intermodulation		–68 dB
Audio Output Power		More than 500 mW internal
Audio Distortion		<3%
Audio Response (1000 Hz ref.)		+1, –3 dB from 6 dB/octave de-emphasis per standard TIA
Frequency Stability (–30°C to +60°C)		±1.5 ppm
Maximum Frequency Separation		18 MHz
TRANSMITTER (Measurements per TIA Standards)		
RF Power Output		High: 3W/Low: 1W
Spurious & Harmonic Emissions		–60 dB
FM Hum & Noise (Companion)*		–40 dB
Emission Designators		16K0F3E
Audio Distortion		<3%
Audio Response (1000 Hz ref.)		+1, –3 dB from 6 dB/octave de-emphasis per standard TIA
Frequency Stability (–30°C to +60°C)		±1.5 ppm
Maximum Frequency Separation		18 MHz (no degradation); 63 MHz talkaround

ENVIRONMENTAL SPECIFICATIONS						
Environment	Mil Spec 810C		Mil Spec 810D		Mil Spec 810E	
	Method	Procedure	Method	Procedure	Method	Procedure
Low Pressure	500.1	I	500.2	II	500.3	II
High Temp.	501.1	I	501.2	I(A1), II	501.3	I(A1), II
Low Temp.	502.1	I	502.2	I(C3), II(C1)	502.3	I(C3), II(C1)
Temp. Shock	503.1	I	503.2	I(A1,C2)	503.3	I(A1,C2)
Solar Radiation	505.1	I	505.2	I	505.3	I
Rain	506.1	N/A	506.2	II	506.3	II
Humidity	507.1	II	507.2	II, III	507.3	II, III
Salt Fog	509.1	I	509.2	I	509.3	I
Dust	510.1	I	510.2	I	510.3	I
Vibration	514.2	VII, VIII	514.3	I(8)	514.4	I(8)
Shock	516.2	I, II, V	516.3	I, IV, VI	516.4	I, IV, VI

FACTORY MUTUAL APPROVALS

For hazardous areas. Approved by Factory Mutual as Intrinsically Safe for Class I, II & III, Division 1, Groups C, D, E, F and G; and as Non-Incendive for Class I, Division 2, Groups A, B, C and D, with E.F. Johnson 587-8150-136 battery.

ACCESSORIES

- Standard Battery
- Intrinsically-Safe Battery
- Battery Eliminator
- Single-Unit Rapid Charger
- Speaker Microphone
- Earphone
- Earphone Adapter
- Leather Case
- Belt Clip
- Leather Belt Loop
- Programming Accessories

* Unit may not meet this spec if used with battery eliminator.



PC CONFIGURE™

PROGRAMMING SOFTWARE

5100 SERIES

5300 SERIES

EFJohnson's PC Configure™ software is the most user-friendly programming software for public safety and service radio users. Program all of your EFJohnson® mobile and portable radios quickly and easily with the same software package. With minimal setup time or training, PC Configure gives you the flexibility to program your EFJohnson® 5100 Series Portable and 5300 Series Mobile radios for any encryption or system type installed on the radio.

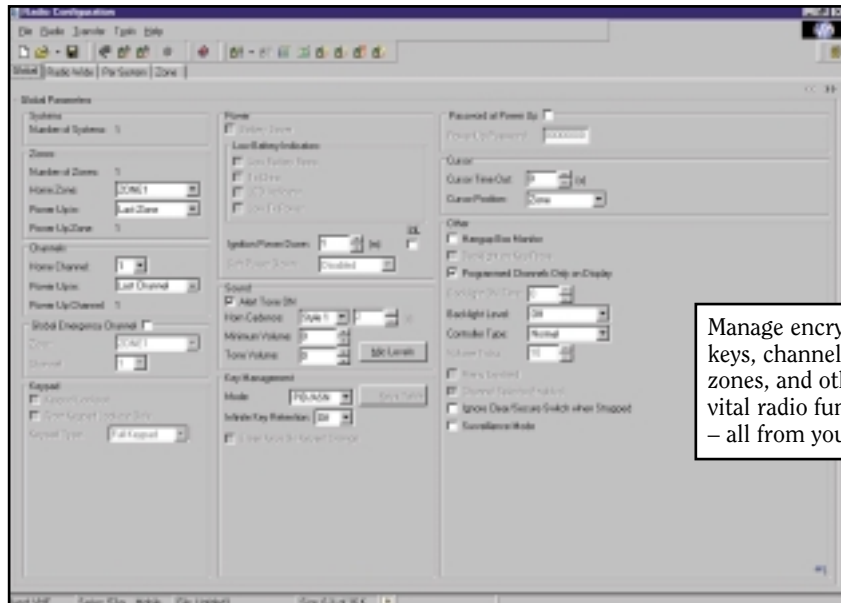
PC Configure is a Windows®-based application. With its intuitive and unique graphical display, PC Configure allows you to re-flash radios much faster than any other radio programming software. PC Configure's "remember" function stores previously programmed parameters (such as software version or options) and recalls them for future use.

Advantages

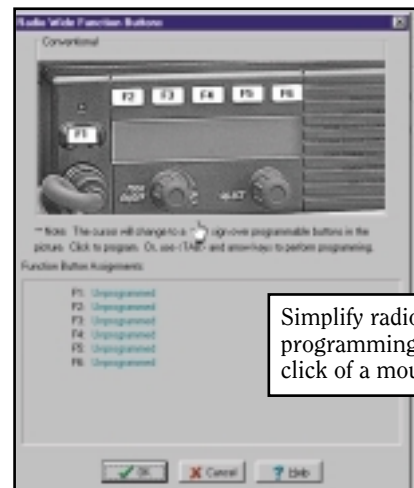
- Minimize your learning curve with an intuitive graphical interface
- Configure mobile and portable radios with a single software package
- Switch between radio and system parameters, and program zone and channel properties with the click of a mouse
- Program your radios in analog conventional, Multi-Net®, Project 25 conventional and trunking, and SMARTNET®/SmartZone®
- Use one template to program multiple radios – simply change unit IDs and download the file to each radio

Computer Requirements

800 MHz Pentium or greater
128 MB RAM
40 MB hard disk space
CD-ROM drive



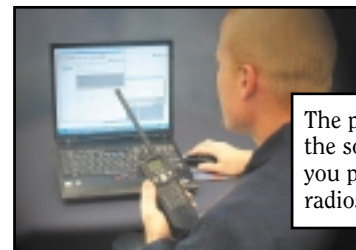
Manage encryption keys, channels, zones, and other vital radio functions – all from your PC



Simplify radio programming with a click of a mouse

EFJohnson

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.



The portability of the software lets you program your radios anywhere.



SMA

SUBSCRIBER MANAGEMENT ASSISTANT

The EFJohnson® Subscriber Management Assistant (SMA) is a versatile tool, but its predominant function is for fast and easy encryption key loading. Since the SMA uses PDA technology in a ruggedized case, it can be used in almost any environment. The SMA connects to an EFJohnson or Motorola® radio via a serial interface. All configuration and modifications are completed through the serial interface. It uses the FIPS validated SEM security algorithms for all security functions, including AES and DES. With its Microsoft Windows® based graphical user interface, the SMA will have you configuring your radios right away.

The SMA enables you to:

- Generate a random DES Key or AES Keys for download to the EFJohnson and Motorola portable radios that are in CKR mode
- Enter your own AES or DES key for download into a portable radio
- Use the Microsoft SQL CE database for storage of security parameters such as AES and DES keys
- Read radio key set information
- Erase all keys from a radio
- Retrieve hardware revision information from the radio
- Select a key set and make that key set active, modify and set KEK parameters, set KMF parameters on the radio, and set or modify RSI parameters
- Create a new database containing security parameters such as AES and DES keys
- Delete or modify an existing database containing security parameters such as AES and DES keys
- Encrypt all keys stored in the SQL CE using a 256-bit AES key



For keyloading functionality, the SMA connects to radios via a special keyloader cable.



Portable Pricing



EFJohnson®

PRICE LIST

ANALOG/DIGITAL PORTABLE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®



FACTORY MUTUAL APPROVALS — 51x6 and 51x7 models only

For hazardous areas. Approved by Factory Mutual as Intrinsically Safe for Class I, II & III, Division 1, Groups C, D, E, F, & G; and as Non-Incendive for Class I, Division 2, Groups A, B, C, & D, with 587-5100-361 battery. DES-XL not FM approved for Group C Ethylene.

To determine the 5100 model to order, choose ONE option from each box (with the exception of the Software Control Option box). Carry the option numbers to the bottom of the page where you will build the model string. The model string will be used for ordering. **To determine the price**, carry the price of the base model and each option to the column at the right. Total all prices at the bottom to determine the radio list price. Base model includes radio, 512 channels/talkgroups, and standard belt clip.

	BASE MODEL: (Select one) 5112 = VHF, 5W, 136-174 MHz, Non-DTMF Keypad\$ 1,644 5113 = VHF, 5W, 136-174 MHz, DTMF Keypad1,891 5122[†] = UHF, 4W, 380-470 MHz, Non-DTMF Keypad1,644 5123[†] = UHF, 4W, 380-470 MHz, DTMF Keypad1,891 5132 = UHF, 4W, 403-470 MHz, Non-DTMF Keypad1,644 5133 = UHF, 4W, 403-470 MHz, DTMF Keypad1,891 5142 = UHF, 4W, 450-512 MHz, Non-DTMF Keypad1,644 5143 = UHF, 4W, 450-512 MHz, DTMF Keypad1,891 5182 = 800, 3W, 806-870 MHz, Non-DTMF Keypad1,644 5183 = 800, 3W, 806-870 MHz, DTMF Keypad1,891 5116 = Intrinsically-safe, VHF, 5W, 136-174 MHz, Non-DTMF Keypad\$ 1,693 5117 = Intrinsically-safe, VHF, 5W, 136-174 MHz, DTMF Keypad1,940 5126[†] = Intrinsically-safe, UHF, 4W, 380-470 MHz, Non-DTMF Keypad1,693 5127[†] = Intrinsically-safe, UHF, 4W, 380-470 MHz, DTMF Keypad1,940 5136 = Intrinsically-safe, UHF, 4W, 403-470 MHz, Non-DTMF Keypad1,693 5137 = Intrinsically-safe, UHF, 4W, 403-470 MHz, DTMF Keypad1,940 5146 = Intrinsically-safe, UHF, 4W, 450-512 MHz, Non-DTMF Keypad1,693 5147 = Intrinsically-safe, UHF, 4W, 450-512 MHz, DTMF Keypad1,940 5186 = Intrinsically-safe, 800, 3W, 806-870 MHz, Non-DTMF Keypad1,693 5187 = Intrinsically-safe, 800, 3W, 806-870 MHz, DTMF Keypad1,940	\$
2	ANTENNA: (Select one) If ordering additional quantities, see 5100 Accessories price page. 1 = VHF-136-151 MHzN/C 6 = VHF-136-174 MHz (wideband)\$ 16 2 = VHF-151-162 MHzN/C 8 = 800 MHzN/C 3 = VHF-162-174 MHzN/C 9 = 800 MHz 1/4 waveN/C 4 = UHF-380-520 MHzN/C	\$
3	BATTERY: (Select one) If ordering additional quantities, see 5100 Accessories price page. 1 = Extra-high capacity NiMHN/C 2 = Alkaline Battery Clamshell\$ 148 6 = Intrinsically-safe extra-high capacity NiMH (Required for 51x6 and 51x7 base models)N/C	\$
4	HIGH VISIBILITY HOUSING: (Select one) 0 = Black housingN/C 1 = Yellow housing\$ 25 2 = Orange housing25	\$
5	PROTOCOL: (Select one) 1 = Analog FMN/C 2 = Project 25 Digital CAI (Common Air Interface) (Includes #1 Analog FM enabled) \$ 412	\$
6	SYSTEM OPTIONS: (Select one) 0 = Conventional\$ 640 1 = SMARTNET® II Trunking (Includes #0 Conventional enabled)594 2 = SmartZone® Trunking (Includes #1 SMARTNET II Trunking, #0 Conventional, and STAR [SmartZone Transfer Area Roaming] enabled)891 3 = Project 25 Trunking (Includes #2 SmartZone, #1 SMARTNET II, #0 Conventional, and STAR enabled)1149	\$
7	SOFTWARE CONTROL OPTIONS: (Continued on page SN-2.) CARRY MODEL NUMBERS AND PRICES FROM PAGE SN-2 TO APPROPRIATE BOXES ON THIS PAGE.	(Price from page SN-2) \$

PRICE OF RADIO:

(List in numerical order. List only Software Control)

† Federal market only.

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EFFECTIVE JULY 16, 2004
Supersedes March 24, 2004
Prices subject to change without notice.

SN-1

PRICE LIST

ANALOG/DIGITAL PORTABLE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®

CONTINUED

SOFTWARE CONTROL OPTIONS: (May select up to four options)

06	= DES/P25 DES-OFB encryption	\$ 550
08	= DES/P25 DES-OFB/AES encryption	750
09	= DES/DES-XL™/DES-OFB encryption	750
10	= DES/DES-XL/DES-OFB/AES encryption	950
11	= Project 25 OTAR Conventional and Trunking	750
13	= Project 25 Data Conventional	143
14	= Project 25 Data Trunking* (Requires System Option #3 P25 Trunking)	143
30	= Keypad Programming (US Federal Government only)	49
50	= Zone Fail-Site Lock (Requires opt. #2 SmartZone in SYSTEM OPTIONS box)	150

**ENTER & ADD
PRICES**

(Up to four software control options per radio may be ordered.)

\$ \$ \$ \$

Total Software Control Options

Copy price of all Software Control Options to page SN-1, Section 7, to calculate total radio price.

\$

				-			-			-								
--	--	--	--	---	--	--	---	--	--	---	--	--	--	--	--	--	--	--

(List in numerical order. List only Software Control Options requested. Leave remaining boxes blank.)

Copy Software Control Option numbers
to page SN-1 to complete the model string number.

* Future option.

NOTE: As a result of the current P25 AES OTAR standard not being NIST certified, any order to EFJohnson for Software Control Options 08, 10, and 11 simultaneously, would require a waiver from the customer deeming FIPS 140-2 approval not applicable.

ACCESSORIES

Part Number	Description	Price
Antennas		
501-0017-100	VHF Antenna, 136-174 MHz, dipole, red core (wideband)	\$ 46
501-0017-101	VHF Antenna, 136-151 MHz, helical, yellow core	30
501-0017-103	VHF Antenna, 151-162 MHz, helical, black core	30
501-0017-105	VHF Antenna, 162-174 MHz, helical, blue core	30
501-0017-107	UHF Antenna, 380-520 MHz, 1/4-wave whip	30
501-0105-012	800 MHz Antenna, 806-870 MHz, 1/4-wave whip	30
501-0105-013	800 MHz Antenna, 806-870 MHz, 1/2-wave whip	30
Audio Accessories		
589-0015-057†	Speaker Microphone	\$ 130
589-0015-058†	Public Safety Speaker Microphone (Available only for 800 MHz. Must order antenna separately.)	265
589-0015-059†	Lightweight Headset with In-Line PTT (requires 589-5100-051 adapter)	113
589-5100-057†	Coil Cord Earphone Kit with Right Angle Plug (requires 589-0015-057 speaker microphone)	70
589-5100-059†	Coil Cord Earphone Kit with Straight Plug (requires 589-0015-057)	70
589-5100-053†	1-Wire Earphone Kit (requires 589-5100-051 adapter)	82
589-5100-055†	2-Wire Palm Mic Kit (requires 589-5100-051 adapter)	230
589-5100-051†	Earphone/Headset Adapter w/3.5mm plug	86
Batteries		
587-5100-360	Extra-High Capacity Battery Pack, NiMH	\$ 100
587-5100-361†	Extra-High Capacity Battery Pack, NiMH, I/S	123
250-5100-280	Alkaline Battery Clamshell Assembly	148
587-5100-100	Battery Eliminator	65
Charger Kits		
585-5100-260	Vehicular Travel Charger (includes mounting bracket)	\$ 120
250-5100-210	Charger Kit with Switching Power Supply, USA AC Cord <i>Includes 585-5100-210 and 585-5100-230</i>	150
250-5100-215	Charger/Conditioner Kit with Switching Pwr Supply, USA AC Cord <i>Includes 585-5100-215 and 585-5100-230</i>	180
250-5100-220	Charger Kit with Switching Power Supply, EURO AC Cord	150
250-5100-225	Charger/Conditioner Kit with Switching Pwr Supply, EURO AC Cord	180
250-5100-240	4-Unit Charger Kit, USA AC Cord <i>Includes 585-5100-240 and four 585-5100-210</i>	550
250-5100-245	4-Unit Charger/Conditioner Kit, USA AC Cord <i>Includes 585-5100-240 and four 585-5100-215</i>	580
250-5100-250	4-Unit Charger Kit, EURO AC Cord	550
250-5100-255	4-Unit Charger/Conditioner Kit, EURO AC Cord	580
585-5100-245	Docking Station Wall-Mount Bracket	75
Charger Replacement Parts		
585-5100-210	Single-Unit Rapid Desktop Charger w/o Power Supply	\$ 115
585-5100-215	Single-Unit Rapid Charger/Conditioner w/o Power Supply	130
585-5100-240	4-Unit Docking Station with Power Supply (requires 585-5100-210 or -215 chargers)	180
585-5100-230	Switching Power Supply 15V, 1.3A (120/230V) for -210/-215 Chgr (requires 597-1001-152 power cord)	45
585-5100-250	Switching Power Supply 15V, 4.5A (120/230V) for -240 Docking Station (requires 597-1001-152 power cord)	45
597-1001-152	Power Cord AC	5

† Factory Mutual approved.



Continued on next page.

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ACCESSORIES (CONT.)

Part Number	Description	Price
Carrying Accessories		
585-5100-120	Leather Case with belt flap	\$ 70
585-5100-121	Leather Case for use with Alkaline Battery Clamshell, with belt flap	70
585-5100-122	Leather Case with 3" D-Swivel belt loop	70
585-5100-125	Nylon Case w/D-Swivel Leather Belt Loop-black	60
585-5100-126	Nylon Case w/D-Swivel Leather Belt Loop-yellow	60
585-5100-135	100% Nylon Case with D-Swivel Nylon Belt Loop-black	60
585-5100-127	D-Swivel Button	26
585-5100-130	Leather 2.5" Belt Loop w/D-Swivel attachment	15
585-5100-132	Leather 3" Belt Loop w/D-Swivel attachment	15
585-5100-128	Belt Clip 2 1/2" (standard), spring loaded	15
585-5100-129	Belt Clip 3" (standard), spring loaded	15
Subscriber Management Assistant		
250-5000-945	<i>EFJohnson's handheld PDA device that currently supports encryption key loading functionality.</i> SMA (Includes HP iPAQ h5550 PocketPC PDA; PDA-DB9 adapter cable; ruggedized PDA case; PDA cradle; PDA charger; charger adapter; operating manual; Microsoft® Active Sync OS; encryption features and software: AES, DES, DES-XL™, DES-OFB, CKR/SLN)	\$ 3200
023-5000-940	Portable Key Loader Cable	275
Encryption Accessories for 3rd Party Keyloading Systems		
585-5000-932	Key Loader Cable	\$ 275
Interoperability Equipment		
250-5000-88x	Tactical Interoperability Kit (TIK) A cost-effective, portable solution to fill communication gaps caused by differing radio systems or loss of range.	See TIK price page for full description and pricing
Programming Accessories		
250-5100-003	PC Configure Programming Kit (023-5100-920 cable, software & manual on CD)	\$ 495
023-9998-488	PCConfigure Programming Software	350
023-5100-920	Radio Personality Programming Cable, radio to computer	120
023-5100-930	Radio Personality Cloning Cable, radio to radio (radio must have Flash code 1.5.0 or later and be programmed using PCConfigure 1.17 or later.)	300
250-5100-005	PCTune Kit (includes PCTune software, radio cable, and audio cable)	399
023-9998-499	PCTune Tuning Software	275
023-5100-940	PCTune Cable	156
023-5100-950	PCTune Audio Cable	22
023-5100-955	Test Jumper Cable, UI board to logic board	175
515-3102-050	SMA to BNC, F to F adapter	80
Factory Services		
299-0045-017	1-year Extended Warranty	\$ 36
299-0045-013	2-year Extended Warranty	55
299-0045-029	3-year Extended Warranty	121
Manuals		
002-5100-001	Quick Reference Guide	\$ 14
002-5100-1005CD	Operators Manual (full detail)	14
001-5100-0014CD	Service Manual (also contains operator's information)	42
299-TRNG-5100	Training CD	50

7700 Series

PRICING INFORMATION

SMARTNET®/SmartZone® 7780/7781 SERIES 800 MHz PORTABLE

**3 watts; 806-824 MHz Transmit, 851-869 MHz Receive
(Transmit in Talkaround)
Up to 256 Channels
NPSPAC**



FACTORY MUTUAL APPROVALS

For hazardous areas. Approved by Factory Mutual as Intrinsically Safe for Class I, II, & III, Division 1, Groups C, D, E, F, & G; and as Non-Incendive for Class I, Division 2, Groups A, B, C, & D, with 587-8150-136 battery.

The 7700 Series 800 MHz analog SMARTNET®/SmartZone® portable radios are synthesized, field programmable, microprocessor controlled portable transceivers, outputting 3.0 or 1.0 watt of RF power. The 7700 Series has a full array of standard features in each of

its three operational modes: conventional analog SMARTNET II, and SmartZone. All of these portable models meet the MIL STD 810 environmental specifications. The 7700 Series is available in two models: DTMF keypad and the 3-key model. An intrinsically-safe version

(7781) is also available.

The EEPROMs are externally programmed with a personal computer, EFJohnson® radio programming software, and interface equipment.

PORTABLE RADIO PACKAGE WITH ACCESSORIES

Portable package includes the radio, battery, antenna, and belt clip. Portable can be ordered with or without rapid charger base and power supply. A software license is included in the price of each radio. See the 7700 Series Accessories page (on back) for additional accessories.

Configuration	Portable With Charger		Portable Without Charger	
	Part Number	Price	Part Number	Price
7780 SMARTNET®II 800 MHz 3-key, 3W	242-7780-302-X	\$ 1,225	242-7780-302	\$ 1,105
7780 SMARTNET®II 800 MHz keypad, 3W	242-7780-303-X	1,225	242-7780-303	1,105
7780 SmartZone® 800 MHz 3-key, 3W	242-7780-502-X	\$ 1,525	242-7780-502	\$ 1,405
7780 SmartZone® 800 MHz keypad, 3W	242-7780-503-X	1,525	242-7780-503	1,405
7781 I.S. SMARTNET®II 800 MHz 3-key, 3W	242-7781-302-X	\$ 1,255	242-7781-302	\$ 1,135
7781 I.S. SMARTNET®II 800 MHz keypad, 3W	242-7781-303-X	1,255	242-7781-303	1,135
7781 I.S. SmartZone® 800 MHz 3-key, 3W	242-7781-502-X	\$ 1,555	242-7781-502	\$ 1,435
7781 I.S. SmartZone® 800 MHz keypad, 3W	242-7781-503-X	1,555	242-7781-503	1,435
		"X" digit = "A" if PS is 120 VAC "B" if PS is 230 VAC		

PORTABLE RADIO PACKAGE with Zone Fail-Site Lock

Portable Radio Package with Zone Fail-Site Lock when ordered with Charger includes the rapid charger base and 120VAC power supply.

Configuration	Portable With Charger		Portable Without Charger	
	Part Number	Price	Part Number	Price
7780 SmartZone® 800 MHz 3-key, 3W	242-7780-502-D	\$ 1,675	242-7780-502-C	\$ 1,555
7780 SmartZone® 800 MHz keypad, 3W	242-7780-503-D	1,675	242-7780-503-C	1,555
7781 I.S. SmartZone® 800 MHz 3-key, 3W	242-7781-502-D	\$ 1,705	242-7781-502-C	\$ 1,585
7781 I.S. SmartZone® 800 MHz keypad, 3W	242-7781-503-D	1,705	242-7781-503-C	1,585

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EFFECTIVE OCTOBER 15, 2003
Supersedes January 4, 2002
Prices subject to change without notice.

SN-11

7700 Series

PRICING INFORMATION

SMARTNET®/SMARTZONE® 7700 SERIES PORTABLE ACCESSORIES

Configuration	Part Number	Price
Batteries/Accessories		
Nickel metal hydride high-capacity battery	587-8150-135	\$ 95
Intrinsically-safe, nickel metal hydride battery	587-8150-136†	150
Battery eliminator	585-5020-031	96
Chargers		
Rapid charger base (must order separate power supply)	585-5020-020	84
120 VAC power supply	585-5020-021	38
230 VAC power supply	585-5020-022	38
6-Unit rapid charger	888-3505-001	650
Antenna		
Flexible antenna – 800 MHz	585-5000-053†	50
Audio Accessories		
Speaker-microphone with coil cord, heavy-duty	589-0015-047†	125
Earphone adapter	585-5000-051†	48
Earphone (for 589-0015-047 and 585-5000-051)	589-9003-004†	18
Heavy-duty earphone with coil cord	250-0881-003	96
Coil Cord Earphone Kit with right angle plug (requires 589-0015-047 speaker microphone)	589-5100-057†	70
Coil Cord Earphone Kit with straight plug (requires 589-0015-047)	589-5100-059†	70
Lightweight headset with inline PTT	589-0015-048	149
Carrying Accessories		
Leather case with D-swivel	585-5000-052	54
Belt loop for D-swivel	023-8790-130	26
D-swivel for attachment to portable	250-5810-123	44
Belt clip	585-5000-054†	24
Programming Accessories		
PCConfigure Programming Kit (software, cable, RPI box, manual) for Windows	250-7780-002	549
Remote programming interface (RPI Box)	023-9800-000	278
Interface cable to connect RPI to computer, DB-9 M-F	597-5900-002	50
Programming cable, RPI to radio	597-2002-122	99
PCConfigure programming software	023-9998-488	350
PCTune tuning software	023-9998-477	275
Manuals		
Operator's manual	002-7780-500	14
Operator's manual-Intrinsically Safe	002-7781-5001	14
Service manual	001-7780-501	42

† Factory Mutual approved.

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SMARTNET® and SmartZone® are registered trademarks of Motorola, Inc.

Infrastructure



EFJohnson[®]

2600 Series

DIGITAL REPEATER/BASESTATION

26x1 – VHF
26x4 – UHF

The **26x1 VHF and 26x4 UHF repeaters** fulfill the demanding requirements of private system operators with features including:

The **Netelligent™ connectivity option** utilizes Voice over Internet Protocol (VoIP) technology to enable intelligent network communications without costly and complex centralized switching equipment.

Dual mode operation meets the requirements of Project 25 digital operation and TIA 603 analog operation.

High reliability for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

Compact design allows efficient use of space. A five-channel repeater, combiner, duplexer, and multicoupler can fit in one eight-foot standard rack.

PC programmability of operating frequency, output power and other functions provides quick installation capability.

Multiple network interfaces support network communications over standard 4-wire interface or via advanced VoIP Ethernet interface.

Conservative design of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

Dual synthesizers with ± 1.0 part per million stability assure on-frequency operation of transmitter and receiver.

Front panel status indicators show operating status and diagnostic information for rapid evaluation and servicing.

Modular construction provides flexible expansion capability and easier maintenance.

Comprehensive tuning software guides the service technician through all the detailed tuneup and setup procedures.

Excellent performance specifications suitable for today's crowded spectrum environment and heavily loaded sites.

Flash memory allows updating of radio operating software via PC to meet future needs.

Signaling choices of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater option.



2600 SERIES

DIGITAL REPEATER/BASESTATION

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #	26X1		26X4	
GENERAL	ANALOG	DIGITAL	ANALOG	DIGITAL
Mounting	19" rack or shelf			
Dimensions (HxWxD)	9.0" x 17.0" x 20.9" (23cm x 43cm x 53cm)			
Weight	66 lbs. (29.95 kg)			
Temperature Range	-30°C to +60°C			
Input Voltage	100 to 240 VAC			
Input Frequency	50 to 60 Hz			
Power Requirements	At 110 W — 560 Watts At 25 W — 170 Watts Standby — 45 Watts		At 110 W — 457 Watts At 25 W — 170 Watts Standby — 45 Watts	
Frequency Resolution	5/6.25 kHz		6.25 kHz	
FCC Type Acceptance Number	ATH2422001-1		ATH2422004-1	
FCC Compliance	Parts 15, 90		Parts 15, 90	
RECEIVER	ANALOG	DIGITAL	ANALOG	DIGITAL
Channel Spacing	30/25/15/12.5 kHz	12.5 kHz	25/12.5 kHz	12.5 kHz
Frequency Range	132-150, 150-178 MHz		380-400, 400-430, 430-470, 470-512 MHz	
Sensitivity: 12 dB SINAD	0.25µV	N/A	0.25µV	N/A
Sensitivity: for 5% BER	N/A	0.25µV	N/A	0.25µV
Selectivity	-85/-80 dB	-60 dB	-90/-75 dB	-60 dB
Signal Displacement Bandwidth	± 2 kHz/± 1 kHz	± 1 kHz	± 2 kHz/± 1 kHz	± 1 kHz
Frequency Stability (-30°C to +60°C)	±1.0 PPM		±1.0 PPM	
Intermodulation Rejection	-85 dB		-85 dB	
Spurious & Image Rejection	-95 dB		-100 dB	
Audio Response (1000 Hz ref.)	+1, -3 dB TIA	As per TIA	+1, -3 dB TIA	As per TIA
Audio Distortion (at 1000 Hz)	Less than 3% @ 0.5W/16 ohms	As per TIA	Less than 3% 0.5W/16 ohms	As per TIA
Hum and Noise (TIA)	-50 dB		-50 dB	
RF Input Impedance	50 ohms		50 ohms	
TRANSMITTER	ANALOG	DIGITAL	ANALOG	DIGITAL
Frequency Range	132-150, 150-178 MHz		380-400, 400-430, 430-470, 470-512 MHz	
RF Output Power	25 to 110 Watts		25 to 110 Watts	
Duty Cycle	100%		100%	
Output Impedance	50 ohm		50 ohm	
Spurious Emissions	-90 dBc		-90 dBc	
Harmonic Emissions	-90 dBc		-90 dBc	
Maximum Deviation	± 5 kHz/± 2.5 kHz	± 3110 Hz	± 5 kHz/± 2.5 kHz	± 3110 Hz
Audio Response	+1, -3 dB TIA	As per TIA	+1, -3 dB TIA	As per TIA
Audio Distortion	Less than 2%	As per TIA	Less than 2%	As per TIA
Emission Designators	11K0F3E, 16K0F3E	8K10F1E	11K0F3E, 16K0F3E	8K10F1E
Hum & Noise (TIA)	-50 /-55 dB		-50 /-55 dB	
Frequency Stability (-30°C to +60°C)	±1.0 PPM		±1.0 PPM	



Five Channels and 7-Foot Rack

STANDARDS COMPLIANCE

EFJohnson's radio repeaters comply with the following standard specifications:
P25 Digital Operation: TIA/TSB 102.CAAB
Analog FM Operation: TIA/EIA 603
EMI/EMC: NTIA Manual Chapter 5
 FCC Part 90
 FCC Part 15
PSTN Line Isolation: FCC Part 68 (USA)



2600 Series

DIGITAL REPEATER/BASESTATION

2607 – 700 MHz
2608 – 800 MHz

The **2607 700 MHz and 2608 800 MHz repeaters** fulfill the demanding requirements of private system operators with features including:

The **Netelligent™ connectivity option** utilizes Voice over Internet Protocol (VoIP) technology to enable intelligent network communications without costly and complex centralized switching equipment.

Dual mode operation meets the requirements of Project 25 digital operation and TIA 603 analog operation.

High reliability for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

Compact design allows efficient use of space. A five-channel repeater, combiner, duplexer, and multicoupler can fit in one eight-foot standard rack.

PC programmability of operating frequency, output power and other functions provides quick installation capability.

Multiple network interfaces support network communications over standard 4-wire interface or via advanced VoIP Ethernet interface.

Conservative design of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

Dual synthesizers with ± 1.0 part per million stability (± 0.1 ppm 700 MHz) assure on-frequency operation of transmitter and receiver.

Front panel status indicators show operating status and diagnostic information for rapid evaluation and servicing.

Modular construction provides flexible expansion capability and easier maintenance.

Comprehensive tuning software guides the service technician through all the detailed tuneup and setup procedures.

Excellent performance specifications suitable for today's crowded spectrum environment and heavily loaded sites.

Flash memory allows updating of radio operating software via PC to meet future needs.

Signaling choices of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater option.



APCO 25
Conventional

Conventional

2600 SERIES

DIGITAL REPEATER/BASESTATION

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #	2607†	2608†	
GENERAL	DIGITAL	ANALOG	DIGITAL
Mounting	19" rack or shelf		
Dimensions (HxWxD)	9.0" x 17.0" x 20.9" (23cm x 43cm x 53cm)		
Weight	66.0 lbs. (29.95 kg)		
Temperature Range	-30°C to +60°C		
Input Voltage	100 to 240 VAC		
Input Frequency	50-60 Hz		
Power Requirements	At 175 W – 680 Watts; At 75 W – 450 Watts; Standby – 45 Watts		
Frequency Resolution	12.5 kHz		
FCC Type Acceptance Number	Pending†	Pending†	
FCC Compliance	Parts 15, 90		
RECEIVER	DIGITAL	ANALOG	DIGITAL
Frequency Range	792–806 MHz	806–825 MHz	
Channel Spacing	12.5 kHz	25/12.5 kHz	12.5 kHz
Sensitivity: 12 dB SINAD	N/A	0.35µV	N/A
Sensitivity: for 5% BER	0.35µV	N/A	0.35µV
Selectivity	-60dB	-85/-80dB	-60dB
Signal Displacement Bandwidth	± 1 kHz	± 2 kHz/± 1 kHz	± 1 kHz
Frequency Stability (-30°C to +60°C)	±1.0 PPM		
Intermodulation Rejection	-80 dB		
Spurious & Image Rejection	-90 dB		
Audio Response (1000 Hz ref.)	As per TIA	+1, -3 dB TIA	As per TIA
Audio Distortion (at 1000 Hz)	As per TIA	Less than 3%	As per TIA
Hum and Noise (TIA)	-45 dB		
RF Input Impedance	50 ohms		
TRANSMITTER	DIGITAL	ANALOG	DIGITAL
Frequency Range	762–776 MHz	851–870 MHz	
RF Output Power	75 to 175 Watts		
Duty Cycle	100%		
Output Impedance	50 ohm		
Spurious Emissions	-90dBc		
Harmonic Emissions	-90dBc		
Maximum Deviation	±3110 Hz	±5.0 kHz/±3110 Hz	
Audio Response	As per TIA	+1, -3 dB TIA	As per TIA
Audio Distortion	As per TIA	Less than 2%	As per TIA
Emission Designators	8K10F1E	16K0F3E, 14K0F3E, 11K0F3E	8K10F1E
Hum & Noise (TIA)	-45 dB/-50 dB		
Frequency Stability (-30°C to +60°C)	±0.1 PPM	±1.0 PPM	



Five Channels and 7-Foot Rack

STANDARDS COMPLIANCE

EFJohnson's radio repeaters comply with the following standard specifications:
P25 Digital Operation: TIA/TSB 102.CAAB
Analog FM Operation: TIA/EIA 603
EMI/EMC: NTIA Manual Chapter 5
 FCC Part 90
 FCC Part 15
PSTN Line Isolation: FCC Part 68 (USA)

[†] This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.



2000 Series

REPEATER/STATION

2008 – 800 MHz
2009 – 900 MHz

LTR-Net® Repeater LTR® Repeater Community Repeater Universal Station

The 2000 Series 800 and 900 MHz repeater fulfills the demanding requirements of SMR and private system operators. Features include:

High reliability for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

Compact design allows efficient use of space. Five repeaters, a combiner, duplexer and multicoupler can fit in one seven-foot standard rack.

PC programmability of operating frequency, output power and other functions provides quick installation capability.

Remote alarms – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

Conservative design of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

Dual synthesizers with ± 0.1 (900 MHz) and ± 1.0 (800 MHz) part per million stability assure on-frequency operation of transmitter and receiver.

Front panel status indicators show operating status and diagnostic information for rapid evaluation and servicing.

Modular construction provides flexible expansion capability and easier maintenance.

Comprehensive tuning software guides the service technician through all the detailed tuneup and setup procedures.

Excellent performance specifications suitable for today's crowded spectrum environment and heavily loaded sites.

Flash memory allows updating of radio operating software via PC to meet future needs.

Enhanced LTR-Net® features, such as auto-registration, wide-area group and private calls, selective radio

inhibit, telephone interconnect, and other specialized call types, are available in the LTR-Net repeater model.

Telephone interconnect options are a feature of the LTR® repeater model. Several levels of functionality are available from over dial to DID with voice prompts, networking, and call detail memory for up to 5000 telephone calls.

Signaling choices of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater.

Interface to vendor equipment for signaling and control is offered with the universal station.



LTR-Net™

LTR®

Conventional

2000 SERIES

REPEATER/STATION

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #	2008	2009
GENERAL	800 MHz	900 MHz
Mounting	19" rack or shelf	
Dimensions (HxWxD)	9.0" x 17.0" x 20.9 (23cm x 43cm x 53cm)	
Weight	63 lbs. (28.58 kg)	
Temperature Range	-30°C to +60°C*	
Input Voltage	100 to 240 VAC auto switchable	100 to 240 VAC, 50-60 Hz
Input Frequency	47 to 63 Hz	47 to 63 Hz
Power Requirements	@175W - 680 watts @75W - 445 watts Standby - 45 watts	@160W - 680 watts @75W - 390 watts Standby - 47 watts
Channel Spacing	25 kHz	25 kHz
Frequency Resolution	12.5 kHz	12.5 kHz
FCC Type Acceptance Number	ATH2422008-1	ATH2422009-1
FCC Compliance	Parts 15, 90	Parts 15, 90
Canada	933 194 294A	933 222 135A
RECEIVER (Measurements per TIA Standards)		
Frequency Range	806-824 MHz	896-901 MHz
Sensitivity: 12 dB SINAD	0.35 µV	0.35 µV
Selectivity	-85 dB	-75 dB
Signal Displacement Bandwidth	± 2.0 kHz	± 1.5 kHz
Spurious & Image Rejection	-90 dB	-90 dB
Offset Channel Selectivity	-20 dB	N/A
Intermodulation	-80 dB	-75 dB
Local Audio Output Power	0.5 watts	0.5 watts
Audio Distortion (at 1000 Hz)	Less than 3%	Less than 3%
Audio Response (1000 Hz ref.)	+1, -3 dB TIA	+1, -3 dB TIA
Hum and Noise (TIA)	-45 dB	-45 dB
Frequency Stability (-30°C to +60°C)	± 1.0 ppm	± 0.1 ppm
TRANSMITTER (Measurements per TIA Standards)		
Frequency Range	851-869 MHz	935-940 MHz
RF Output Power	75 to 175 watts	75 to 160 watts
Duty Cycle	100%	100%
Spurious Emissions	-90 dBc	-90 dBc
Harmonic Emissions	-90 dBc	-90 dBc
Audio Response	+1, -3 dB TIA	+1, -3 dB TIA
Audio Distortion	Less than 2%	Less than 2%
Hum & Noise (TIA)	-45 dB	-45 dB
Frequency Spread	6 MHz	5 MHz
Frequency Stability (-30°C to +60°C)	± 1.0 ppm	± 0.1 ppm
FCC Emission Designators	14KOF3E, 14KOF3D, 14KOF1D 16KOF3E, 16KOF3D, 16KOF1D	11KOF3E, 11KOF1D

* Temperature range for Model 38A Repeater Panel is 0° to +60°C.



Five Channels and 7-Foot Rack



Model 38 Repeater Panel is included in the Community Repeater package



2000 Series

2001 – VHF

COMMUNITY REPEATER/UNIVERSAL STATION

2001 VHF Community Repeater/Universal Station

The **2001 VHF repeaters** fulfill the demanding requirements of private system operators with features including:

High reliability for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

Compact design allows efficient use of space. A five-channel repeater, combiner, duplexer, and multicoupler can fit in one eight-foot standard rack.

PC programmability of operating frequency, output power and other functions provides quick installation capability.

Remote alarms – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

Conservative design of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

Dual synthesizers with ± 2.5 part per million stability assure on-frequency operation of transmitter and receiver.

Front panel status indicators show operating status and diagnostic information for rapid evaluation and servicing.

Modular construction provides flexible expansion capability and easier maintenance.

Comprehensive tuning software guides the service technician through all the detailed tuneup and setup procedures.

Excellent performance specifications suitable for today's crowded spectrum environment and heavily loaded sites.

Flash memory allows updating of radio operating software via PC to meet future needs.

Signaling choices of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater.



2000 SERIES

COMMUNITY REPEATER/UNIVERSAL STATION

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #	2001	
GENERAL	12.5 KHz	25 KHz
Mounting	19" rack or shelf	
Dimensions (HxWxD)	9.0" x 17.0" x 20.9" (23cm x 43cm x 53cm)	
Weight	66 lbs. (29.95 kg)	
Temperature Range	-30°C to +60°C*	
Input Voltage	100 to 240 VAC	
Input Frequency	50 to 60 Hz	
Power Requirements	At 110 W — 560 watts at 25 W — 170 watts Standby — 45 watts	
Frequency Resolution	5/6.25 kHz	
FCC Type Acceptance Number	ATH2422001-1	
FCC Compliance	Parts 15, 90	
Canada	933195702A	
RECEIVER (Measurements per TIA 603 Standards)		
Channel Spacing	12.5/15 kHz	25/30 kHz
Frequency Range	150—178 MHz	
Sensitivity: 12 dB EIA SINAD	0.25 µV	
Selectivity	-80 dB	-85 dB
Signal Displacement Bandwidth	± 1 kHz	± 2 kHz
Spurious & Image Rejection	-100 dB	
Intermodulation EIA SINAD	-85 dB	
Local Audio Output Power	0.5 watts/16 ohms	
Audio Distortion (at 1000 Hz)	Less than 3% at 0.5 watts/16 ohms	
Audio Response (1000 Hz ref.)	+1, -3 dB TIA	
Hum and Noise (TIA)	-50 dB	
Frequency Stability (-30°C to +60°C)	±1/2.5 PPM	
TRANSMITTER (Measurements per TIA 603 Standards)		
Frequency Range	150—178 MHz	
RF Output Power	25 to 110 watts	
Duty Cycle	100%	
Output Impedance	50 Ohm	
Spurious Emissions	-90 dBc	
Harmonic Emissions	-90 dBc	
Audio Response	+1, -3 dB TIA	
Audio Distortion	Less than 2%	
Hum & Noise (TIA)	-50 dB	-55 dB
Emission Designators	16K0F3E, 11K0F3E	
Frequency Spread	6 MHz	
Frequency Stability (-30°C to +60°C)	±1/2.5 PPM	

* Temperature range for Model 38A Repeater Panel is 0° to +60°C.



Five Channels and 7-Foot Rack



The Model 38 repeater panel comes with the 2001 VHF community repeater.



2000 Series

2004 – UHF

COMMUNITY REPEATER/UNIVERSAL STATION

2004 UHF Community Repeater/Universal Station

The **2000 Series UHF repeater** fulfills the demanding requirements of SMR and private system operators with features including:

High reliability for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

Compact design allows efficient use of space. A five-channel repeater, a combiner, duplexer and multicoupler can fit in one seven-foot standard rack.

PC programmability of operating frequency, output power and other functions provides quick installation capability.

Remote alarms – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

Conservative design of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

Dual synthesizers with ± 1.0 part per million stability assure on-frequency operation of transmitter and receiver.

Front panel status indicators show operating status and diagnostic information for rapid evaluation and servicing.

Modular construction provides flexible expansion capability and easier maintenance.

Comprehensive tuning software guides the service technician through all the detailed tuneup and setup procedures.

Excellent performance specifications suitable for today's crowded spectrum environment and heavily loaded sites.

Flash memory allows updating of radio operating software via PC to meet future needs.

Signaling choices of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater.



2000 SERIES

COMMUNITY REPEATER/UNIVERSAL STATION

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #	2004	
GENERAL	12.5 KHz	25 KHz
Mounting	19" rack or shelf	
Dimensions (HxWxD)	9.0" x 17.0" x 20.9 (23cm x 43cm x 53cm)	
Weight	66 lbs. (29.95 kg)	
Temperature Range	-30°C to +60°C*	
Input Voltage	100 to 240 VAC	
Input Frequency	50 to 60 Hz	
Power Requirements	@110W – 457 watts @25W – 170 watts Standby – 45 watts	
Frequency Resolution	6.25 kHz	
FCC Type Acceptance Number	ATH2422004-1	ATH2422004
FCC Compliance	Parts 15, 90	
Canada	Pending	
RECEIVER (Measurements per TIA 603 Standards)		
Channel Spacing	12.5 kHz	25 kHz
Frequency Range	400–512 MHz	
Sensitivity: 12 dB SINAD	0.35 µV	
Selectivity	-85 dB	-90 dB
Signal Displacement Bandwidth	± 1.0 kHz	± 2.0 kHz
Spurious & Image Rejection	-100 dB	
Intermodulation	-85 dB	
Local Audio Output Power	0.5 watts	
Audio Distortion (at 1000 Hz)	Less than 3%	
Audio Response (1000 Hz ref.)	+1, -3 dB TIA	
Hum and Noise (TIA)	-50 dB	
Frequency Stability (-30°C to +60°C)	± 1.0 ppm	
TRANSMITTER (Measurements per TIA 603 Standards)		
Frequency Range	400–512 MHz	
RF Output Power	25 to 110 watts	
Duty Cycle	100%	
Spurious Emissions	-90 dBc	
Harmonic Emissions	-90 dBc	
Audio Response	+1, -3 dB TIA	
Audio Distortion	Less than 2%	
Hum & Noise (TIA)	-50 dB	-55 dB
Frequency Spread	6 MHz	
Frequency Stability (-30°C to +60°C)	± 1.0 ppm	
FCC Emission Designators	Pending	16KOF3E, 16KOF1D, 16KOF3D



Five Channels and 7-Foot Rack



The Model 38 repeater panel comes with the 2004 UHF community repeater.

* Temperature range for Model 38A Repeater Panel is 0° to +60°C.



2000 Series

LTR® REPEATER

2004 – UHF

2004 UHF LTR® Repeater

The **2000 Series UHF LTR® repeater** fulfills the demanding requirements of SMR and private system operators with features including:

High reliability for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

Compact design allows efficient use of space. A five-channel repeater, a combiner, duplexer and multicoupler can fit in one seven-foot standard rack.

PC programmability of operating frequency, output power and other functions provides quick installation capability.

Remote alarms – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

Conservative design of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

Dual synthesizers with ± 1.0 part per million stability assure on-frequency operation of transmitter and receiver.

Front panel status indicators show operating status and diagnostic information for rapid evaluation and servicing.

Modular construction provides flexible expansion capability and easier maintenance.

Comprehensive tuning software guides the service technician through all the detailed tuneup and setup procedures.

Excellent performance specifications suitable for today's crowded spectrum environment and heavily loaded sites.

Flash memory allows updating of radio operating software via PC to meet future needs.

Telephone interconnect options are a feature of the LTR repeater model when used with the Viking® Network Controller (VNC). Several levels of functionality are available from over dial to DID with voice prompts, networking, and call detail memory for up to 5000 telephone calls.



2000 SERIES

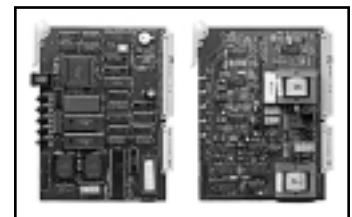
LTR® REPEATER

All Specifications are typical and subject to normal manufacturing tolerances.

MODEL #	2004	
GENERAL	12.5 KHz	25 KHz
Mounting	19" rack or shelf	
Dimensions (HxWxD)	9.0" x 17.0" x 20.9 (23cm x 43cm x 53cm)	
Weight	66 lbs. (29.95 kg)	
Temperature Range	-30°C to +60°C	
Input Voltage	100 to 240 VAC	
Input Frequency	50 to 60 Hz	
Power Requirements	@110W – 457 watts @25W – 170 watts Standby – 45 watts	
Frequency Resolution	6.25 kHz	
FCC Type Acceptance Number	ATH2422004-1	ATH2422004
FCC Compliance	Parts 15, 90	
Canada	Pending	
RECEIVER (Measurements per TIA 603 Standards)		
Channel Spacing	12.5 kHz	25 kHz
Frequency Range	400–512 MHz	
Sensitivity: 12 dB SINAD	0.35 µV	
Selectivity	-85 dB	-90 dB
Signal Displacement Bandwidth	± 1.0 kHz	± 2.0 kHz
Spurious & Image Rejection	-100 dB	
Intermodulation	-85 dB	
Local Audio Output Power	0.5 watts	
Audio Distortion (at 1000 Hz)	Less than 3%	
Audio Response (1000 Hz ref.)	+1, -3 dB TIA	
Hum and Noise (TIA)	-50 dB	
Frequency Stability (-30°C to +60°C)	± 1.0 ppm	
TRANSMITTER (Measurements per TIA 603 Standards)		
Frequency Range	400–512 MHz	
RF Output Power	25 to 110 watts	
Duty Cycle	100%	
Spurious Emissions	-90 dBc	
Harmonic Emissions	-90 dBc	
Audio Response	+1, -3 dB TIA	
Audio Distortion	Less than 2%	
Hum & Noise (TIA)	-50 dB	-55 dB
Frequency Spread	6 MHz	
Frequency Stability (-30°C to +60°C)	± 1.0 ppm	
FCC Emission Designators	Pending	16KOF3E, 16KOF1D, 16KOF3D



Five Channels and 7-Foot Rack



Viking Network Controller (VNC) provides DTMF interconnect and easy to implement networking features to your LTR system.



2000 Series

MODEL 38 REPEATER PANEL

The Model 38 repeater logic panel adds a variety of control functions to the 2000 Series repeaters. Designed primarily for enhanced management of SMR systems, the Model 38 panel controls system access, call time, cross-tone or cross-code encoding, and tracks

user air time. Model 38 functions are programmable through DTMF or RS-232 ports, and most functions are programmable on/off per user.

Tone/code validation enables or disables remote users over the air.

Air-time keeper totals the air time for each user.

Privacy mode prevents users from jumping in during transmitter hang time.

Programmable functions include hang time, time-out timer, Morse code ID interval, and many others.



TECHNICAL SPECIFICATIONS

MODEL DESIGNATOR	MODEL 38
GENERAL	
Adjustments	Four adjustments from rear panel: Input Level; CTCSS Encode Level; Output Level; Squelch.
Indicators	Power; Carrier; Decode; Encode; Transmit; DTMF
Local Programming Port	Front panel audio jack for local DTMF programmer
Serial Data Port	RS-232 compatible levels
Interface	Tx data, Rx data, common ground
Handshake	Follows XON/OFF protocol
Baud Rate	Selectable: 150; 300; 600; 1200; 2400; 4800; 9600
Rear Switches	Audio Input Level (high low), Audio Input (flat de-emphasized), CTCSS Output Level (high low), CTCSS (Output flat de-emphasized) Audio Output Level (high low), COR (internal/external): COR Polarity (positive/negative)
Long Digit Reset	A single DTMF digit received by the Model 38 for 15 seconds may be used to reset the Model 38 remotely.
ToneLock	ToneLock decodes a CTCSS tone with a receiver quieting level of 3 dB SINAD after initial acquisition.
COR Input Range	Adjustable threshold of 0 to 7V DC. Level must change by at least 1 volt between carrier and no carrier conditions.
Squelch Tail Elimination	Model 38 transmits a 180° phase reversal for 150 ms. Model 38 decodes mobile's reverse phase burst.
Operating Temperature	0 to 65° C
DECODER	
Frequency Range	67 to 250.3 Hz
Number of Tones	38
Number of Digital Codes	22
Bandwidth	1.5%
Hold Time	0.2 to 2.5 seconds adjustable
Tone Acquisition	0.12 seconds
ENCODER	
Frequency Accuracy	0.1 Hz
Frequency Stability	Crystal controlled
TONE ENCODER	
Morse ID Frequency	1200 Hz; adjustable \pm 800 Hz
Beep Frequency	1000 Hz; adjustable 400 to 4000 Hz
DTMF Encoder	Standard DTMF tones

MODEL 38 PROGRAMMABLE FUNCTIONS	
Programming Validation	DTMF or RS-232.
Privacy Mode	Enable/disable per user. Locks out other users during Tx hold time. Programming on/off per tone code.
Reserve Mode	Reserves tone code of disabled user. Programmable on/off per user.
Encode Select	Encode tone code programmable to any tone code per user.
Encode On Off	Encode tone code can be enabled/disabled during the Tx hold time. Programmable on/off per user.
DTMF Regeneration	Long DTMF "*" mutes audio and enables DTMF regeneration. All received digits regenerated until DTMF time-out expires (adjustable). Ideal for DTMF paging or for use with a phone patch.
DTMF Time-Out	1 to 9 seconds.
Temporary Cross	Allows mobiles on different tones codes to converse. Programmable on/off per user.
Last User ID	Sends last user's number in DTMF when user unkeys. Programmable on/off per user.
Morse ID	0 to 8 characters programmable per user.
Morse ID Interval	1 to 99 minutes.
ID Frequency	400 to 2000 Hz.
Readback ID Mode	Reads back user's Morse ID.
Courtesy Beep	Sent when user unkeys. Programmable on/off per user.
Beep Frequency	400 to 4000 Hz.
Tx Hold Time	0.0 to 9.9 sec. in 0.1 sec. steps.
CTCSS Hold Time	0.2 to 2.5 seconds.
Alarm Code	0 to 8-digit DTMF with warble alert. With or without any tone code.
Call Time Limit	1 to 99 minutes.
Idle Duration	Requires user to remain idle to reset call timer, 1 to 99 seconds.
Hog Penalty	10 to 9990 seconds.
Setup Procedure	Test modes for system adjustments.
User Time Counter	Up to 250 hours per tone code.
Clear Time Counter	Clear one or all time counters.
Air-Time Retrieval	Slow Morse code or DTMF. Compatible with Zetron, CSI or ComSpec DTMF decoder.



Infrastructure Pricing



EFJohnson[®]

PRICE LIST

ANALOG/DIGITAL REPEATER/BASESTATION

APCO PROJECT 25/CONVENTIONAL

To determine the 2600 model to order, choose ONE option from each box. Carry the option numbers to the bottom of the page where you will build the model string. The model string will be used for ordering. **To determine the price**, carry the price of each option to the column at the right. Total all prices at the bottom to determine the repeater list price.

SELECT FREQUENCY BAND AND RANGE: (Select one)		PRICE	ENTER & ADD PRICES OF SELECTED OPTIONS FROM BOXES ON THE LEFT:
1	2621 = VHF, 132-150 MHz	..\$ 7,995	
	2631 = VHF, 150-178 MHz	..7,995	
	2624 = UHF, 380-400 MHz	..7,995	
	2634 = UHF, 400-430 MHz	..7,995	
	2644 = UHF, 430-470 MHz	..7,995	
	2654 = UHF, 470-512 MHz	..7,995	
SELECT TYPE: (Select one)			
2	1 = Repeater	..\$ N/C	
	2 = Receiver Only	..(6,000)	
SELECT CONFIGURATION OPTION: (Select one)			
3	0 = Standard Hardware Platform	..\$ N/C	
	1 = Community Repeater (Includes Model 38 Repeater Panel)	..1,500	
SELECT NETWORK OR INTERFACE SET-UP: (Select one)			
4	0 = No Network Interface	..\$ N/C	
	1 = Netelligent™ VoIP Enabled	..3,000	
	4 = 4-Wire E&M Jumper Selection (full duplex jumper)	..N/C	
SELECT PRIMARY SIGNALING: (Select one)			
5	B = Analog Conventional	..\$ N/C	
	C = Project 25 Conventional	..5,000	
SELECT SECONDARY SIGNALING: (Select one)			
6	A = No Additional Signaling	..\$ N/C	
	B = Analog conventional	..N/C	
7 FUTURE OPTION: A = (Place holder only.)			
		..NA	
8 REVISION: B			
		..\$ N/C	
PRICE OF REPEATER:			

2600 Series

PRICE LIST

ACCESSORIES

Configuration	Part Number	Price
2600 Programming Cable (RJ45 to RJ45), 7 ft.	597-9000-003	\$ 29
2600 Service Kit – includes tuning software and programming cable for all bands	250-2600-200	850
Service Microphone	250-0740-300	72
Battery Backup Option (26 VDC input) With Cable	023-2000-835	840
T/R Switch, 2600 Basestation	250-2600-010	450
PC to Model 38 Programming Cable	023-2000-191	60
SOFTWARE		
2600 PC Programmer (only available with purchase of a repeater)	023-9998-511	\$ 250
Custom Frequency Programming and Setup	023-2000-100	120
One-time Upgrade — Flash	299-SOFT-500	2,995
MANUALS		
Service Manual (on CD)	001-2600-0014CD	84
Quick Start Guide	004-2600-001	14

2000 Series

PRICING INFORMATION

2004 UHF LTR® REPEATER

110 Watts; 400-520 MHz



The 2004 repeater is a synthesized, field programmable, 25 or 12.5 kHz channel spacing, microprocessor controlled, one-channel shelf or rack mount transceiver. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters, programmable Morse code ID, programmable power output, status

and diagnostic indicators, and RF alarms.

The basic repeater package includes the repeater, AC power supply, AC power cable, and adjustable rack mounting brackets. See the VX Accessories for additional accessories. Enclosed cabinets are not available and are not recommended. The 2004 repeater is used

for basic trunked dispatch operation and provides telephone interconnect when the Telephone Interconnect Card is added.

For conventional UHF repeater and universal station, please refer to the 2004 UHF Community Repeater/Universal Station price page 3-15.

LTR® 2004 REPEATER

Model Number	Configuration	Part Number	Price
2004	LTR® Repeater — 25-110 Watts	242-20X4-213	\$ 7,595
"X" digit = 3 if frequency is 400-430 MHz 4 430-470 MHz 5 470-512 MHz 6 480-520 MHz			

ACCESSORIES

Configuration	Part Number	Price
Two-wire telephone interconnect card	023-2000-370	\$ 2,160
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	432
Battery backup option (26 VDC input) with cable	023-2000-835	840
RJ-11 to BNC adapter (required when mixing 1010/2004 or when using Viking Networking products. One per station.)	023-2000-194	126
Two-foot RG-58 coax with male BNC connectors for HSDB	023-4406-505	48
Six-foot RG-58 coax with male BNC connectors for HSDB	597-3001-214	36
Service microphone	589-0015-011	84
50-ohm termination HSDB	023-4406-504	12
Service Manual-LTR 2004 Repeater	001-2004-201	84
SOFTWARE		
PGMR 2004 programming software (only available with purchase of a repeater)	023-9998-390	\$ 250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

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2000 Series

PRICING INFORMATION

2008 High Power 800 MHz LTR® REPEATER

175 Watts

806-824 MHz Receive, 851-869 MHz Transmit



The 2000 Series high power repeater is a synthesized, field programmable, microprocessor controlled, one-channel shelf or rack mount transceiver. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters, programmable Morse code ID, programmable power output, status and diagnostic indicators, and RF alarms.

The basic repeater package includes the repeater, AC power supply, AC power cable and adjustable rack mounting brackets. See the 2008 Accessories for additional accessories. Enclosed cabinets are not available and are not recommended; open frame self-supporting racks are available for mounting and are listed on the accessory price page. The 2008 repeater is used for basic trunked dispatch operation and provides

telephone interconnect when the Telephone Interconnect Card is added.

The 2000 Series high power repeater is built to stock and is tuned and programmed to an operating frequency midband. As an option, the 2008 high power can be built to order and will be tuned and programmed to the operating frequencies specified on your order. See the accessory list below.

MODEL 2008 REPEATER

Model Number	Configuration	Part Number	Price
2008	LTR® High Power Repeater — 75-175 Watts	242-2008-234	\$ 9,935

ACCESSORIES

Configuration	Part Number	Price
Two-wire telephone interconnect card	023-2000-370	\$ 2,160
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	432
Battery backup option (26 VDC input) with cable	023-2000-835	840
RJ-11 to BNC Adapter (required when mixing 8000/2008 or when using Viking Networking products. 1 per station.	023-2000-194	126
Two-foot RG-58 coax with male BNC connectors for HSDB	023-4406-505	48
Six-foot RG-58 coax with male BNC connectors for HSDB	597-3001-214	36
Service microphone	589-0015-011	84
50-ohm termination HSDB	023-4406-504	12
Service manual-LTR 2008 Repeater	001-2008-203	84
SOFTWARE		
PGMR 2000 programming software (only available with purchase of a repeater)	023-9998-297	\$ 250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

2000 Series

PRICING INFORMATION

2008 High Power 800 MHz LTR® REPEATER SYSTEM ACCESSORIES

175 Watts

The following combining systems include the Telewave model M101-860 combiner technology with the TWR8 receiver multicoupler. The minimum frequency spacing must be 250 kHz. The system also includes associated cabling from the transmitter and receiver of the 2000

Series station. The system terminates at the input to the receiver multicoupler and the output to the transmitter combiner. The output connector of the transmitter combiner is a 7/16 DIN. Separate antennas are recommended for transmit and receive. Backbone vendor equipment

(combiners, duplexers) is available to order through EFJohnson Customer Service. RF lightning protection can be ordered separately. Relay racks are also ordered separately from the list below.

Configuration	Part Number	Price
RF Lightning Protector Polyphaser™, model IS-CT50HN-MA <i>One lightning protector is recommended per antenna.</i>	585-0898-003	\$ 308
Racks 7' floor mount 19" open rack with accessories*, setup and test 7' 6" floor mount 19" open rack with accessories*, setup and test 8' floor mount 19" open rack with accessories*, setup and test	023-2000-216 023-2000-217 023-2000-218	1,360 1,610 1,654
AC Power Distribution AC power strip – 115 VAC (1 required per 2 repeaters) AC power strip – 230 VAC (1 required per 2 repeaters)	597-1004-010 023-2000-212	474 994

* Accessories include all mounting hardware, rack ground bar and wire to repeaters.

2000 Series

PRICING INFORMATION

2009 High Power 900 MHz LTR® REPEATER

160 Watts

896-901 MHz Receive; 935-940 MHz Transmit



The 2000 Series high power LTR® repeater is a synthesized, field programmable, microprocessor-controlled, one-channel shelf or rack mount transceiver. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters, programmable Morse code ID, programmable power output, status and diagnostic indicators, and RF alarms.

The basic repeater package includes the repeater, AC power supply, AC power cable, and adjustable rack mounting brackets. See the 2009 Accessories for additional accessories. Enclosed cabinets are not available and are not recommended; open frame self-supporting racks are available for mounting and are listed in the accessory section. The 2009 repeater is used for basic trunked dispatch operation and

provides telephone interconnect when the Telephone Interconnect Card is added.

The 2000 Series repeater is built to stock and is tuned and programmed to an operating frequency midband. As an option, the 2009 can be built to order and will be tuned and programmed to the operating frequencies specified on your order. See the accessory list below.

MODEL 2009 REPEATER

Model Number	Configuration	Part Number	Price
2009 OCXO-2009	LTR Repeater — 75-160 Watts	242-2009-234	\$ 10,000
	OCXO Drawer — Master reference oscillator with 8-port distribution. Requires optional splitter for more than 8 channels.		
	One OCXO Two OCXOs	250-2000-921 250-2000-922	3,000 3,992

ACCESSORIES

Configuration	Part Number	Price
Two-wire telephone interconnect card	023-2000-370	\$ 2,160
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	432
Battery backup option (26 VDC input) with cable	023-2000-835	840
Reference oscillator splitter shelf (Required for more than eight channels)	023-2000-924	658
Reference oscillator adapter kit (Allows operation of mixed 8900 and 2009 systems. Requires 023-2000-924.)	023-2000-923	212
RJ-11 to BNC adapter (required when mixing 8900/2009 or when using Viking Networking products. One per station.)	023-2000-194	126
Redundant OCXO	561-0006-012	994
Companding module	023-2000-940	108
5-channel HSDB kit for interface to existing systems	023-2000-139	258
Two-foot RG-58 coax with male BNC connectors for HSDB	023-4406-505	48
Six-foot RG-58 coax with male BNC connectors for HSDB	597-3001-214	36
Service microphone	589-0015-011	84
50-ohm termination HSDB	023-4406-504	12
Service manual—LTR 2009 Repeater	001-2009-201	84
SOFTWARE		
PGMR 2000 programming software (only available with purchase of a repeater)	023-9998-297	\$ 250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

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2000 Series

PRICING INFORMATION

2009 High Power 900 MHz LTR® REPEATER SYSTEM ACCESSORIES

160 Watts

The following combining systems include the Telewave model M101-860 combiner technology with the TWR8 receiver multicoupler. The minimum frequency spacing must be 250 kHz. The system also includes associated cabling from the transmitter and receiver of the 2000 Series

station. The system terminates at the input to the receiver multicoupler and the output to the transmitter combiner. The output connector of the transmitter combiner is a 7/16 DIN. Separate antennas are recommended for transmit and receive. Backbone vendor equipment (com-

biners, duplexers) is available to order through EFJohnson Customer Service. RF lightning protection can be ordered separately. Relay racks are also ordered separately from the list below.

Configuration	Part Number	Price
RF Lightning Protectors Type N lightning arrestor, model PD-395 Polyphaser™, model IS-PT50HN-MA <i>One lightning protector is recommended per antenna.</i>	585-0898-001 585-0898-005	\$ 120 300
Racks 7' floor mount 19" open rack with accessories*, setup and test 7' 6" floor mount 19" open rack with accessories*, setup and test 8' floor mount 19" open rack with accessories*, setup and test	023-2000-216 023-2000-217 023-2000-218	1,360 1,610 1,654
AC Power Distribution AC power strip – 115 VAC (1 required per 3 repeaters) AC power strip – 230 VAC (1 required per 3 repeaters)	597-1004-010 023-2000-212	474 994

* Accessories include all mounting hardware, rack ground bar and wire to repeaters.

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Polyphaser is a trademark of Polyphase Corporation.

2000 Series

PRICING INFORMATION

2001 VHF COMMUNITY REPEATER VHF UNIVERSAL STATION

110 Watts; 150-178 MHz



The 2001 is a synthesized, field programmable, 25 or 12.5 kHz channel spacing, microprocessor controlled, one-channel shelf or rack mount transceiver. Can be purchased to operate as a repeater or base station. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters,

programmable power output, status and diagnostic indicators, and RF alarms. All station packages include the station, AC power supply, AC power cable and adjustable rack mounting brackets. Enclosed cabinets are not available and are not recommended.

The community repeater package includes a Model 38 Call Guard®/Digital Call Guard DTMF program-

mable repeater panel and interface cable. The panel must be mounted separately.

The universal model requires the addition of a vendor device to provide signaling and control. An interface specification is available, under appropriate license, for guidance to vendors in developing an interface for their products.

2001 STATION

Model	Repeater Configuration	Part Number	Price
2001	Community Repeater — 25-110 W	242-2031-413	\$ 8,405
2001	Community Repeater Base Station — 25-110 Watts	242-2031-473	8,995
2001	Universal Station — 25-110 Watts	242-2031-313	7,295
2001	Universal Station Base Station — 25-110 Watts	242-2031-373	7,495

ACCESSORIES

Configuration	Part Number	Price
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	\$ 432
Service microphone	589-0015-011	84
Battery backup option (26 VDC input) with cable	023-2000-835	840
Service Manual	001-2001-300	84
SOFTWARE		
PGMR 2004 programming software (only available with purchase of a repeater)	023-9998-390	\$ 250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

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2000 Series

PRICING INFORMATION

2004 UHF COMMUNITY REPEATER UHF UNIVERSAL STATION

110 Watts; 400-520 MHz



The 2004 is a synthesized, field programmable, 25 or 12.5 kHz channel spacing, microprocessor controlled, one-channel shelf or rack mount transceiver. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters, programmable power output, status and diagnostic indicators, and RF alarms. All station packages include the station, AC power supply, AC

power cable and adjustable rack mounting brackets. Enclosed cabinets are not available and are not recommended.

The community repeater package includes a Model 38 Call Guard®/Digital Call Guard DTMF programmable repeater panel and interface cable. The panel must be mounted separately.

The universal model requires the addition of a vendor device to

provide signaling and control. An interface specification is available, under appropriate license, for guidance to vendors in developing an interface for their products. The vendor should contact EFJohnson Marketing for licensing information.

For trunked UHF repeater model, please refer to the 2004 UHF LTR® Repeater price page 3-7.

2004 STATION

Model Number	Configuration	Part Number	Price
2004	Community Repeater — 25-110 Watts	242-20X4-413	\$ 8,405
2004	Universal Station — 25-110 Watts	242-20X4-313	7,295
"X" digit = 3 if frequency is 400-430 MHz 4 430-470 MHz 5 470-512 MHz 6 480-520 MHz			

ACCESSORIES

Configuration	Part Number	Price
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	\$ 432
Service microphone	589-0015-011	84
Battery backup option (26 VDC input) with cable	023-2000-835	840
Service Manual (Includes addendum for community repeater)	001-2004-301	84
SOFTWARE		
PGMR 2004 programming software (only available with purchase of a repeater)	023-9998-390	\$ 250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

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2000 Series

PRICING INFORMATION

2008 High Power 800 MHz Community Repeater 800 MHz Universal Station

Community Repeater – 175 Watts
Universal Station – 175 Watts
806-824 MHz Receive, 851-869 MHz Transmit



The 2000 Series high power station is a synthesized, field programmable, microprocessor controlled, one-channel shelf or rack mount transceiver. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters, programmable power output, status and diagnostic indicators and RF alarms. All station packages include the station, AC power supply, AC power cable and adjustable rack mounting brackets. Enclosed

cabinets are not available and are not recommended; open frame self-supporting racks are available for mounting and are listed on the accessory price page.

The community repeater package includes a Model 38 Call Guard®/ Digital Call Guard DTMF programmable repeater panel and interface cable. The panel must be mounted separately.

The universal model requires the addition of a vendor device to provide signaling and control. An

interface specification is available, under appropriate license, for guidance to vendors in developing an interface for their products. The vendor should contact EFJohnson Marketing for licensing information.

The 2000 Series station is built to stock and will be tuned and programmed to the operating frequency midband. As an option, the 2008 can be built to order and will be tuned and programmed to the operating frequencies specified on your order. See the accessory list below.

MODEL 2008 STATION

Model Number	Configuration	Part Number	Price
2008	Community Repeater — 75-175 Watts	242-2008-434	\$ 10,607
2008	Universal Station — 75-175 Watts	242-2008-334	9,687

ACCESSORIES

Configuration	Part Number	Price
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	\$ 432
Battery backup option (26 VDC input) with cable	023-2000-835	840
Service microphone	589-0015-011	84
Service manual—2008 Conventional Repeater	001-2008-300,-301	
SOFTWARE		
PGMR 2000 programming software (only available with purchase of a repeater)	023-9998-297	\$ 250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

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2000 Series

PRICING INFORMATION

2008 High Power 800 MHz Community Repeater 800 MHz Universal Station System Accessories

175 Watts

The following combining systems include the Telewave model M101-860 combiner technology with the TWR8 receiver multicoupler. The minimum frequency spacing must be 250 kHz. The system also includes associated cabling from the transmitter and receiver of the 2000

Series station. The system terminates at the input to the receiver multicoupler and the output to the transmitter combiner. The output connector of the transmitter combiner is a 7/16 DIN. Separate antennas are recommended for transmit and receive. Backbone vendor equipment

(combiners, duplexers) is available to order through EFJohnson Customer Service. RF lightning protection can be ordered separately. Relay racks are also ordered separately from the list below.

Configuration	Part Number	Price
RF Lightning Protector Polyphaser™, model IS-CT50HN-MA <i>One lightning protector is recommended per antenna.</i>	585-0898-003	\$ 308
Racks 7' floor mount 19" open rack with accessories*, setup and test 7' 6" floor mount 19" open rack with accessories*, setup and test 8' floor mount 19" open rack with accessories*, setup and test	023-2000-216 023-2000-217 023-2000-218	1,360 1,610 1,654
AC Power Distribution AC power strip – 115 VAC (1 required per 2 repeaters) AC power strip – 230 VAC (1 required per 2 repeaters)	597-1004-010 023-2000-212	474 994

* Accessories include all mounting hardware, rack ground bar and wire to repeaters.

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2000 Series

PRICING INFORMATION

2009 HIGH POWER 900 MHz COMMUNITY REPEATER 900 MHz UNIVERSAL STATION

Community Repeater – 160 Watts
Universal Station – 160 Watts
896-901 MHz Receive; 935-940 MHz Transmit



The 2009 Series high power station is a synthesized, field programmable, microprocessor controlled, one-channel shelf or rack mount transceiver. Standard features include status and alarm displays, 100 to 240 volt, 50 to 60 Hz power supply, programmable frequency and setup parameters, programmable power output, status and diagnostic indicators and RF alarms. All station packages include the station, AC power supply, AC power cable and adjustable rack mounting brackets. Enclosed cabinets

are not available and are not recommended; open frame self-supporting racks are available for mounting and are listed on the accessory price page.

The community repeater package includes a Model 38 Call Guard®/ Digital Call Guard DTMF programmable repeater panel and interface cable. The panel must be mounted separately.

The universal model requires the addition of a vendor device to provide signaling and control. An

interface specification is available, under appropriate license, for guidance to vendors in developing an interface for their products. The vendor should contact EFJohnson Marketing for licensing information.

The 2000 Series station is built to stock and will be tuned and programmed to the operating frequency midband. As an option, the 2009 can be built to order and will be tuned and programmed to the operating frequencies specified on your order. See the accessory list below.

MODEL 2009 STATION

Model Number	Configuration	Part Number	Price
2009	Community Repeater — 75-160 Watts	242-2009-434	\$ 10,648
2009	Universal Station — 75-160 Watts	242-2009-334	9,760
OCXO-2009	OCXO Drawer — Master reference oscillator with 8-port distribution. Requires optional splitter for more than 8 channels.		
	One OCXO	250-2000-921	3,000
	Two OCXOs	250-2000-922	3,992

ACCESSORIES

Configuration	Part Number	Price
Service kit includes extender card, extender cables, TIC bias cable and programming cable	250-2000-230	\$ 432
Battery backup option (26 VDC input) with cable	023-2000-835	840
Service microphone	589-0015-011	84
Reference oscillator splitter shelf (Required for more than eight channels)	023-2000-924	658
Service manual—2009 Conventional Repeater	001-2009-301	84
SOFTWARE		
Single unit software license (required with purchase of each repeater)	564-5000-001	\$ 10
PGMR 2000 programming software (only available with purchase of a repeater)	023-9998-297	250
Custom frequency programming and setup	023-2000-100	120
One-time upgrade — flash	299-SOFT-500	2,995
One-time upgrade — program	299-SOFT-501	500

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2000 Series

PRICING INFORMATION

2009 HIGH POWER 900 MHz COMMUNITY REPEATER 900 MHz UNIVERSAL STATION SYSTEM ACCESSORIES

160 Watts

The following combining systems include the Telewave model M101-860 combiner technology with the TWR8 receiver multicoupler. The minimum frequency spacing must be 250 kHz. The system also includes associated cabling from the transmitter and receiver of the 2000 Series

station. The system terminates at the input to the receiver multicoupler and the output to the transmitter combiner. The output connector of the transmitter combiner is a 7/16 DIN. Separate antennas are recommended for transmit and receive. Backbone vendor equipment (com-

biners, duplexers) is available to order through EFJohnson Customer Service. RF lightning protection can be ordered separately. Relay racks are also ordered separately from the list below.

Configuration	Part Number	Price
RF Lightning Protectors Type N lightning arrestor, model PD-395 Polyphaser™, model IS-PT50HN-MA <i>One lightning protector is recommended per antenna.</i>	585-0898-001 585-0898-005	\$ 120 300
Racks 7' floor mount 19" open rack with accessories*, setup and test 7' 6" floor mount 19" open rack with accessories*, setup and test 8' floor mount 19" open rack with accessories*, setup and test	023-2000-216 023-2000-217 023-2000-218	1,360 1,610 1,654
AC Power Distribution AC power strip – 115 VAC (1 required per 3 repeaters) AC power strip – 230 VAC (1 required per 3 repeaters)	597-1004-010 023-2000-212	474 994

* Accessories include all mounting hardware, rack ground bar and wire to repeaters.

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